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Countering Air and Missile Threats

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PREFACE

1. Scope

This publication provides doctrine for joint operations to counter theater air and missile threats across the range of military operations.

2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff. It sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in operations and provides the doctrinal basis for interagency coordination and for US military involvement in multinational operations. It provides military guidance for the exercise of authority by combatant commanders and other joint force commanders (JFCs) and prescribes joint doctrine for operations and training. It provides military guidance for use by the Armed Forces in preparing their appropriate plans. It is not the intent of this publication to restrict the authority of the JFC from organizing the force and executing the mission in a manner the JFC deems most appropriate to ensure unity of effort in the accomplishment of the overall objective.

3. Application

a. Joint doctrine established in this publication applies to the commanders of combatant commands, subunified commands, joint task forces, subordinate components of these commands, and the Services.

b. The guidance in this publication is authoritative; as such, this doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. If conflicts arise between the contents of this publication and the contents of Service publications, this publication will take precedence unless the Chairman of the Joint Chiefs of Staff, normally in coordination with the other members of the Joint Chiefs of Staff, has provided more current and specific guidance. Commanders of forces operating as part of a multinational (alliance or coalition) military command should follow multinational doctrine and procedures ratified by the United States. For doctrine and procedures not ratified by the United States, commanders should evaluate and follow the multinational command's doctrine and procedures, where applicable and consistent with US law, regulations, and doctrine.

For the Chairman of the Joint Chiefs of Staff:

WALTER L. SHARP
Lieutenant General, USA
Director, Joint Staff

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SUMMARY OF CHANGES
REVISION OF JOINT PUBLICATION 3-01
DATED 19 OCTOBER 1999

- **Subsumes doctrinal construct of Joint Publication (JP) 3-01.5, *Doctrine for Joint Theater Missile Defense,* and incorporates its relevant doctrine that was made parts of draft JPs 3-01.2, *Joint Doctrine for Offensive Operations for Countering Air and Missile Threats*, and 3-01.3, *Joint Doctrine for Defensive Operations for Countering Air and Missile Threats*. Deletes term, acronym, and definition of joint theater missile defense (JTMD).**

- **Incorporates relevant doctrine from JP 3-01.4, *JTTP for Joint Suppression of Enemy Air Defenses (J-SEAD),* which was incorporated into JP 3-01.2.**

- **Consolidates numerous details from texts of JPs 3-01.2 and 3-01.3.**

- **Refines definition of air defense, defines missile defense, and uses the term missile defense in the text, when more appropriate than the general term air defense.**

- **Adds significant discussion of identification process for tracking including the identification, commitment, and engagement authorities.**

- **Adds discussion of combat identification and recognizes its new definition in JP 3-0, *Joint Operations*.**

- **Defines battle management with short discussion.**

- **Defines regional and sector air defense commanders and describes their commands.**

- **Adds discussion of the necessity and utility of Army air defense fire control officer/element to an area/regional/sector air defense command.**

- **Describes joint position of the deputy area air defense commander for air and missile defense that may be held by the commander of an Army air and missile defense command in addition to being a theater Army air and missile defense coordinator.**

- **Adds brief discussion about the joint interface control officer.**

- **Updates discussion linking theater counterair to homeland defense.**

- **Describes emergence of global missile defense and relationship to theater missile defense under counterair and homeland defense.**

- **Adds appendix for combat identification and appendixes from JP 3-01.3 discussing the area air defense plan format, defensive counterair estimate format, and theater missile systems.**

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- **Discusses Fundamentals for Planning and Executing Offensive Counterair Operations**
- **Outlines Fundamentals for Planning and Executing Defensive Counterair Operations**

Overview of Joint Counterair Operations

Joint counterair operations are executed by all components, using a variety of integrated weapons systems and sensors to counter threats, both before and after launch.

The purpose of counterair is to **attain the desired degree of air superiority required by the joint force commander (JFC) to accomplish the assigned mission.** The degree of control of the air domain may vary from local air superiority to theater air supremacy, depending on the situation and the JFC's concept of operations. Air superiority may be needed for different lengths of time, ranging from a few minutes to the duration of the conflict, and also may vary with geographic areas. In some situations the commander may be resource limited, having only adequate assets to establish air superiority for specific periods of time. The JFC normally seeks to gain and maintain air superiority as quickly as possible to allow friendly forces to operate without prohibitive interference from antiaircraft artillery (AAA) and enemy air and missile threats while denying the enemy the same freedom of action. US forces must be capable of countering the air and missile threats from initial force projection through redeployment of friendly forces or the joint force may yield the initiative to the enemy. The proliferation of missiles and advances in missile technologies, coupled with weapons of mass destruction (WMD), make missiles a particularly difficult and dangerous threat.

The degree of air superiority may vary.

The counterair mission integrates both offensive and defensive operations, by all capable joint force components, to counter the air and missile threat by attaining and maintaining air superiority. Counterair operations may use aircraft with weapons and/or sensors, surface-to-surface missiles, surface-to-air missiles

(SAMs), air defense artillery, air-to-surface missiles, special operations forces (SOF), and information operations (IO) to destroy or negate enemy aircraft and missiles, before and after launch. Generally, offensive counterair (OCA) operations seek to dominate enemy airspace and prevent the launch of threats, while defensive counterair (DCA) operations defeat enemy air and missile threats attempting to penetrate or attack through friendly airspace. Joint forces must be integrated to exploit the mutually beneficial effects of offensive and defensive operations to destroy, neutralize, or minimize air and missile threats. While theater missile (TM) defense is integral to success of counterair operations, rather than separating operations between countering missiles and aircraft, the counterair framework is based on integrating offensive and defensive operations against both aircraft and missile threats.

Counterair operations are both offensive

OCA is defined as offensive operations to destroy, disrupt, or neutralize enemy aircraft, missiles, launch platforms, and their supporting structures and systems both before and after launch, but as close to their source as possible. The goal of OCA operations is to prevent the launch of enemy aircraft and missiles by destroying them and their overall supporting infrastructure prior to employment. This could mean preemptive action against an adversary.

and defensive.

DCA is all defensive measures designed to detect, identify, intercept, and destroy or negate enemy forces attempting to penetrate or attack through friendly airspace. The goal of DCA operations, in concert with OCA operations, is to provide an area from which forces can operate, secure from air and missile threats.

Integration and synchronization of offensive counterair (OCA) and defensive counterair (DCA) operations is vital.

Although OCA and DCA are considered separate operations, **they must be mutually supporting to facilitate unity of effort.** Many of the same forces may be required for both OCA and DCA operations, and early, continuous, and close coordination is required. Leveraging a mixture of capabilities from components bolsters the friendly force potential and likely will frustrate the enemy's ability to defend itself.

Potential adversary air and missile threats continue to grow in numbers and capabilities.

Expanded technology and proliferation of TMs expand the scope and complexity of protecting friendly forces and vital interests. **The proliferation of WMD, coupled with a conventional means of delivery, greatly increases potential lethality of any adversary** and elevates the importance of employing a robust counterair capability to protect US and friendly forces and areas.

Further, the detection capabilities, engagement ranges, mobility, and lethality of SAM systems and fighter aircraft have significantly increased. Cruise missiles (CMs) and unmanned aircraft systems also present elusive targets and will remain difficult to detect, identify, and engage.

Security and defense of the US homeland.

Proliferation of advanced technologies for missiles, guidance systems, and WMD warheads have **increased the potential missile threat to the homeland.** There are potential adversaries with access to WMD and potentially credible aircraft or missile delivery systems—such a threat will increase with time. This is significant because the predominant threat is not from a competing superpower, but more likely from the deliberate launch of a ballistic missile from a "rogue state," failed state, or terrorist group. Deterrence is not possible against some threats. To protect the homeland, an overseas JFC may be tasked to support homeland defense by a preemptive attack on hostile missile threats or DCA support after the launch of a hostile missile.

Command and Control of Joint Counterair Operations

Unity of effort, centralized planning, and decentralized execution are key considerations.

The manner in which a JFC organizes forces directly affects their responsiveness and versatility. Based on the situation, the JFC normally tailors forces to the specific tasks to enable effective spans of control, responsiveness, tactical flexibility, and protection. Because the counterair mission can involve all components of the joint force, **clear command relationships and properly assigned responsibilities are essential for effective and efficient operations.**

A JFC may designate a joint force air component commander.

If the JFC designates a joint force air component commander (JFACC), **the JFC also normally designates the JFACC as the supported commander for the counterair mission.** As a joint mission area, counterair is conducted by all components with the necessary capabilities, with the JFC/JFACC ensuring unity of effort, centralized planning and direction, and decentralized execution. The JFC determines the most appropriate command relationships for the component forces/capabilities made available for counterair. Regardless of the command relationship, all counterair forces are subject to the rules of engagement (ROE), airspace control, weapons control measures, and fire control orders established by the JFACC, area air defense commander (AADC), and/or airspace control authority (ACA) and approved by the JFC.

Area air defense commander.

The JFC designates an AADC with the authority to plan, coordinate, and integrate overall joint force DCA operations. The AADC normally is the component commander with the

preponderance of air and missile defense (AMD) capability and the command and control (C2) and intelligence capability to plan, coordinate, and execute integrated AMD operations, including real time battle management. With the support of the component commanders, **the AADC develops, integrates, and distributes a JFC-approved joint area air defense plan (AADP)**.

Airspace control authority.

The JFC designates an ACA (normally the JFACC) **who has overall responsibility for establishing and operating the airspace control system (ACS).** The ACA develops policies and procedures for airspace control that are incorporated into an airspace control plan (ACP) and promulgated throughout the operational area. A key responsibility of the ACA is to provide the flexibility needed within the ACS to meet contingency situations that necessitate rapid employment of forces.

Multinational counterair operations.

Since most joint operations are now conducted within a multinational context (i.e., an alliance or coalition), JFCs must evaluate key considerations and differences involved in planning, coordinating, and conducting counterair operations in a multinational environment. A major characteristic of operating in the multinational environment is that consensus through compromise is often essential to success. The traditional command relationships used by US forces generally may not be possible with all multinational force (MNF) partners because of political necessity. The JFC should strive for documented relationships such as memorandums of agreement and/or status-of-forces agreements to articulate not only command relationships but also collateral support requirements. No matter how the MNF is organized, the organizational structure and command relationships must be clearly understood by all commanders and supported by the C2 capability. The JFACC/AADC should consider using liasion officers to assess and/or assist MNF partners' counterair capabilities and to maintain span of control and keep forces connected at the tactical level.

Command and control systems and functions.

Requirements.

Infrastructure.

Joint counterair operations require reliable C2 capabilities that allow the JFC, JFACC, AADC, ACA, and component commanders to integrate, synchronize, and deconflict OCA and DCA operations. The C2 systems should be capable of rapidly exchanging information, interfacing among components, and displaying a common operational picture (COP) to all participating components. The C2 infrastructure should consist of interoperable systems that provide complete coverage for an integrated diverse force spread across a theater/joint operations area (JOA) including considerations for any MNF assets. Systems that make up this

Resources.

architecture should be connected to commanders at appropriate decision and execution levels to integrate forces and missions. Service components, the joint force special operations component commander, and specialized joint communications elements provide the core of the communications capabilities for C2 for the joint force.

Situational awareness — a prerequisite for commanders to understand and anticipate counterair opportunities and challenges.

A primary objective the staff seeks to attain for the commander and for subordinate commanders is situational awareness. Knowledge of friendly capabilities, as well as enemy capabilities, intentions, and likely courses of action enables commanders to focus joint counterair efforts where they best and most directly contribute to achieving air superiority objectives. The JFC uses a COP as a graphic depiction of the situation within the theater/JOA. The COP is not real time and is at best near real time. The COP is defined as a single identical display of relevant information shared by more than one command. A COP facilitates collaborative counterair planning and assists all echelons to achieve situational awareness.

Battle Management.

Battle management is defined as the management of activities within the operational environment based on the commands, direction, and guidance given by appropriate authority. It entails visualizing where, when, and with which forces to apply capabilities against specific threats. Successful counterair battle management supports synchronization and integration of active and passive air defense efforts with other air operations, supporting unity of effort and reducing expenditure of resources and the risks of fratricide.

Joint Counterair Planning

Counterair planning considerations include accurate intelligence preparation of the operational environment (IPOE) and joint intelligence preparation of the operational environment (JIPOE), airspace control, ROE, identification (ID) and combat identification (CID) requirements, and some major enabling capabilities.

Joint intelligence preparation of the operational environment considerations.

JIPOE is described as the continuous, analytical process used by joint intelligence organizations to produce intelligence assessments, estimates, and other intelligence products to support the JFC's decision-making process and all joint force planning. JIPOE helps the JFC to react faster and make better decisions

than the adversary, or simply stated, to stay inside the enemy's decision loop.

Airspace control considerations.

The primary goal of combat zone airspace control is to enhance combat effectiveness of the joint force. Airspace control should maximize the effectiveness of combat operations without adding undue restrictions and with minimal adverse impact on the capabilities of any Service/functional component. For counterair, all components of the joint force may potentially share a part of the theater/JOA airspace for offensive/defensive operations. This environment becomes increasingly complex with the addition of civilian, nongovernmental and intergovernmental organizations, interagency, host nation, and MNF users.

The ACA establishes an ACS that is responsive to the needs of the JFC and integrates when appropriate the ACS with that of the host nation. Beginning with an ACP approved by the JFC, the ACA develops broad policies and procedures for airspace control and for the coordination required among units within the theater/JOA. Implementation of the general guidance of the ACP is accomplished through airspace control orders (ACOs) that provide specific airspace control procedures applicable for defined periods of time. The ACO is an order that provides the details of the approved requests for airspace coordinating measures (ACMs) and is published either as part of the air tasking order (ATO) or as a separate document. ACMs are employed to facilitate the efficient use of airspace to accomplish missions and simultaneously provide safeguards for friendly forces.

Rules of engagement.

ROE are directives issued by a competent military authority that delineate the circumstances and limitations under which US forces will initiate and/or continue combat engagement with other forces encountered. Normally, the initial ROE are already established by higher authority or an existing plan. The JFC is responsible for establishing and implementing the ROE and anticipating changes to ROE based on operational necessity such as changing phases of an operation. Centrally planned ROE, ID, and engagement procedures are vital for minimizing duplication of effort and the potential for fratricide while providing necessary flexibility to engage.

Identification process in areas of potential or actual conflict.

ID, the process of determining the friendly or hostile character of an unknown detected contact, is an essential and inseparable part of airspace control and air defense operations. For the purposes of counterair, the intent of an ID process is to either facilitate airspace control or to support an engagement decision through CID.

CID is the process of attaining an accurate characterization of detected objects in the operational environment sufficient to support an engagement decision. Ideally, the CID process uses the most positive ID methods available to allow the highest confidence required for that decision, because it normally is one of the most critical decisions to be made.

Enabling capabilities. A number of major enabling capabilities are available to the joint force and should be considered when planning counterair operations. **SOF** core tasks should be considered when planning counterair operations. SOF can aid counterair operations by providing information or by destroying or disrupting air and missile assets, bases, logistic sites, and C2 facilities. **IO** can also provide significant capabilities against targets sets such as C2 systems, air defense nodes, missile sites, and airfields/operating bases. **Space forces** provide ballistic missile launch warnings, cueing, and attack assessments, (launch locations, headings, and impact areas), global and theater-/JOA-wide communications, current and forecast weather information, space-based intelligence, surveillance, and reconnaissance (ISR), global positioning system, and theater-/JOA-wide ID/CID systems support. The **intelligence system** is vital to the decision-making cycle and must support the status, assessment, planning, warning, and JIPOE and IPOE functions, as well as target prioritization and engagement decisions. Situational awareness relies on joint force **ISR** capabilities. Finally, **air refueling** is one of the most important force multipliers and enabling functions available for counterair and joint air operations.

Offensive Counterair Planning and Operations

OCA operations normally have a high-priority as long as the enemy has the air and missile capability to threaten friendly forces and the JFC does not have the degree of air superiority desired to accomplish the objectives required for the end state. **OCA operations reduce the risk of air and missile attacks, allowing friendly forces to focus on their mission objectives.** The preferred method of countering air and missile threats is to destroy or disrupt them prior to launch using OCA operations conducted over enemy territory.

OCA planning. OCA planning begins with JIPOE and IPOE and considers the JFC's assessment of the overall air and missile threat, target data base, ROE, objectives, priorities, missions, available friendly forces, and the weight of effort or force apportionment decision. Through centralized planning

and direction, the JFACC synchronizes/deconflicts OCA operations with DCA and other joint operations and relies on robust C2 systems for decentralized execution. Decentralized execution allows components and units to exercise initiative, responsiveness, and flexibility within their command authorities to accomplish their tasks. The preponderance of OCA operations are conducted with joint air forces/capabilities that are integrated in action through the joint air operations plan (JAOP). OCA planning is an integral part of this overall joint air operations planning. The air estimate process has six phases that result in the JAOP.

OCA operations.

Counterair operations can be preemptive or reactive, but sustained efforts may be required to reduce or neutralize hostile air and missile capabilities until the desired degree of air superiority is attained for the JFC. OCA missions may be planned or immediate. Missions against planned targets are included in the ATO and rely on continuous and accurate intelligence to identify them at particular locations and times. Immediate targets are those unanticipated/unplanned targets that fall outside the ATO cycle and require immediate action. These targets cannot be effectively attacked unless responsiveness and flexibility is built into the targeting process and the ATO.

To ensure unity of effort, conservation of force, and prevent fratricide, attacks within a designated surface area of operations (AO) requires coordination with that supported component commander, as designated by the JFC. For a land AO, the land force commander normally establishes a fire support coordination line (FSCL) as a permissive fire support coordination measure. Attacks short of the FSCL are controlled by the land force commander. Beyond the FSCL, coordination and restrictive measures are used to avoid conflicting or redundant operations. Forces attacking targets beyond the FSCL must coordinate with all affected commanders to avoid fratricide, both in the air and on the ground. Under exceptional circumstances, if approved by the JFC, the inability to perform coordination may not preclude attacking the target, with the commander of the attacking force assuming the increased risk of fratricide.

OCA operations include attack operations, suppression of enemy air defenses, fighter escort, and fighter sweep.

Defensive Counterair Planning and Operations

DCA operations consist of active and passive AMD measures executed through a joint C2 infrastructure. The AADC normally is responsible for developing an integrated air defense system (IADS) by integrating the capabilities of different components with a robust C2 architecture. **Because of their time-sensitive nature, DCA operations require streamlined coordination and decision-making processes.** The AADC uses assigned campaign plan tasks to develop the AADP with the coordination of Service/functional component commanders, MNF partners, and the JFC's staff. The AADP is the integration of active air defense design, passive defense measures, and the C2 system to provide a comprehensive approach to defending against the threat.

DCA planning considerations.

Through promulgation of the AADP, the AADC implements theater-/JOA-wide DCA priorities, authorities, procedures, tasks, and actions approved by the JFC. DCA operations employ a mix of weapon, sensor, communications, and C2 systems from all components into an IADS to protect friendly forces, assets, population centers, and interests from air and missile threats. Assets used in conducting DCA operations normally include fixed-wing aircraft, SAMs and AAA, and C2 systems, all networked into an IADS using a redundant and flexible C2 architecture with interoperable data links, voice command circuits, and common displays. In DCA operations, the first action generally belongs to the adversary and the IADS must be flexible enough to respond to the most challenging threats.

An IADS is not a formal system in itself but the aggregate of Service/functional component air defense systems comprised of sensors, weapons, C2, communications, intelligence systems, and personnel, operating in a theater/JOA under the command of an AADC. An IADS provides the best capability for mutual support and economy of force for the air and missile defense of vital areas and protection of the joint force in general. Competing demands for DCA resources require detailed planning so that every asset is employed to the full extent of its capability.

Enemy counterair threats are comprised of two main elements: aircraft (manned and unmanned), and missiles. Missiles pose a significant challenge since they are often difficult to detect and destroy after launch.

The geographic combatant commanders should specifically focus intelligence efforts on potential adversaries and their air and missile threats in their area of responsibility/theater and adjacent areas of interest. Emphasis should be placed on WMD capabilities and potential aircraft and missile delivery systems.

Identification and tracking.

Detection, tracking, and ID, are dependent upon the surveillance plan. The three most commonly accepted plans include mutual support (preferred method), track/report by exception, and track production areas (or a combination). Each has advantages, depending on the mix of surveillance sensors and platforms and their degree of interoperability.

Weapon engagement zones (WEZs) are a critical part of DCA planning because they represent part of the current defense posture against the air and missile threats. WEZs are established through the AADP and ACMs and can be changed as necessary. WEZs also represent the integration of airspace control with air and missile defenses.

DCA operations can be passive.

Passive air defense provides individual and collective protection of friendly forces and critical assets. Passive air defense is the responsibility of commanders at all levels of the joint force. The AADC is responsible for timely warning of attack, which initiates some of the passive defense measures. General warnings indicate that attacks are imminent or have occurred. Specific warnings signify that specific units or areas are in danger of attack. Passive AMD measures include detection and warning systems, camouflage, concealment, deception, hardening, reconstruction, nuclear, biological, and chemical defensive equipment and facilities, redundancy, dispersal, and mobility.

Active air defense.

Active air defense is direct defensive action taken to destroy, nullify, or reduce the effectiveness of hostile air and missile attacks. Although DCA operations are defensive in nature, they should be conducted as far from friendly areas as feasible. Advanced warnings of hostile air and missile actions is vital for a layered defense. Intercepts as early as possible facilitate necessary multiple engagements. To ensure attrition of enemy air and missile threats, the engagement process must continue throughout the approach, entry, and departure from the friendly operational area. The strength of an IADS is the synchronization of the integrated surface-to-air and air-to-air systems in mutual support of defensive coverage for the operational area.

Active missile defense. Under the counterair framework, active missile defense is integrated with active air defense as a DCA operation. Generally, the same weapons used for missile defense are capable of air defense. Certain Army forces and Navy forces SAM systems are specifically capable against theater ballistic missiles as well as air-breathing threats (aircraft and CMs). The important factor is the enemy threat and the conservation of missile defense forces to ensure that unique capability is not exhausted when alternative air defense strategies and tactics could be used against air-breathing threats.

CONCLUSION

This publication provides doctrine for joint operations to counter theater air and missile threats across the range of military operations.

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CHAPTER I
INTRODUCTION

"If we lose the war in the air, we lose the war and we lose it quickly."

Field Marshal Bernard Montgomery

1. General

a. To protect US and friendly forces and US vital interests from air and missile threats, joint force commanders (JFCs) (i.e., combatant commanders (CCDRs) or their designated subordinate joint task force (JTF) commanders), integrate the capabilities of each component of the joint force to gain and maintain air superiority. Historically, air superiority has proven to be a prerequisite to success for an operation/campaign because it prevents enemy air and missile threats from interfering with operations of friendly air, land, maritime, space, and special operations forces (SOF), assuring freedom of action and movement. Air superiority also provides protection for friendly population centers, logistic sites and other critical assets, and politically sensitive assets of host nations (HNs). Using both defensive and offensive counterair (OCA) operations, the JFC employs complementary weapon systems and sensors to protect the force. These operations not only defend against attack, but also ensure that US forces can strike potential threats prior to their employment against friendly forces. Unity of effort, centralized planning and direction, and decentralized execution have proven to be vital tenets for countering air and missile threats that may have an engagement window of only a matter of minutes. In such a time-sensitive environment, the JFC must ensure that component systems are integrated and interoperable.

Air superiority is essential for the success of most military operations.

b. **The purpose of counterair is to attain the desired degree of air superiority required by the JFC to accomplish the assigned mission.** The degree of control of the air domain may vary from local air superiority to theater air supremacy, depending on the situation and the JFC's concept of operations. Air superiority may be needed for different lengths of time, ranging from a few minutes to the duration of the conflict, and also may vary with geographic areas. In some situations the commander may be resource limited, having only adequate assets to establish air superiority for specific periods of time. **The JFC normally seeks to gain and maintain air superiority as quickly as possible to allow friendly forces to operate without prohibitive interference from antiaircraft artillery (AAA) and enemy air and missile threats while denying the enemy the same freedom of action**. US forces must be capable of countering the air and missile threats from initial force projection through redeployment of friendly forces or the joint force may yield the initiative to the enemy. The proliferation of missiles and advances in missile technologies, coupled with weapons of mass destruction (WMD), make missiles a particularly difficult and dangerous threat.

c. Counterair operations usually begin early in the conduct of joint operations to produce the desired degree of air superiority at the times and places chosen by the JFC. However, **air superiority may not totally eliminate the air and missile threat**.

Counterair integrates capabilities from all components.

2. Counterair Framework

The counterair mission integrates both offensive and defensive operations, by all capable joint force components, to counter the air and missile threat by attaining and maintaining air superiority (see Figure I-1). Counterair operations may use aircraft with weapons and/or sensors,

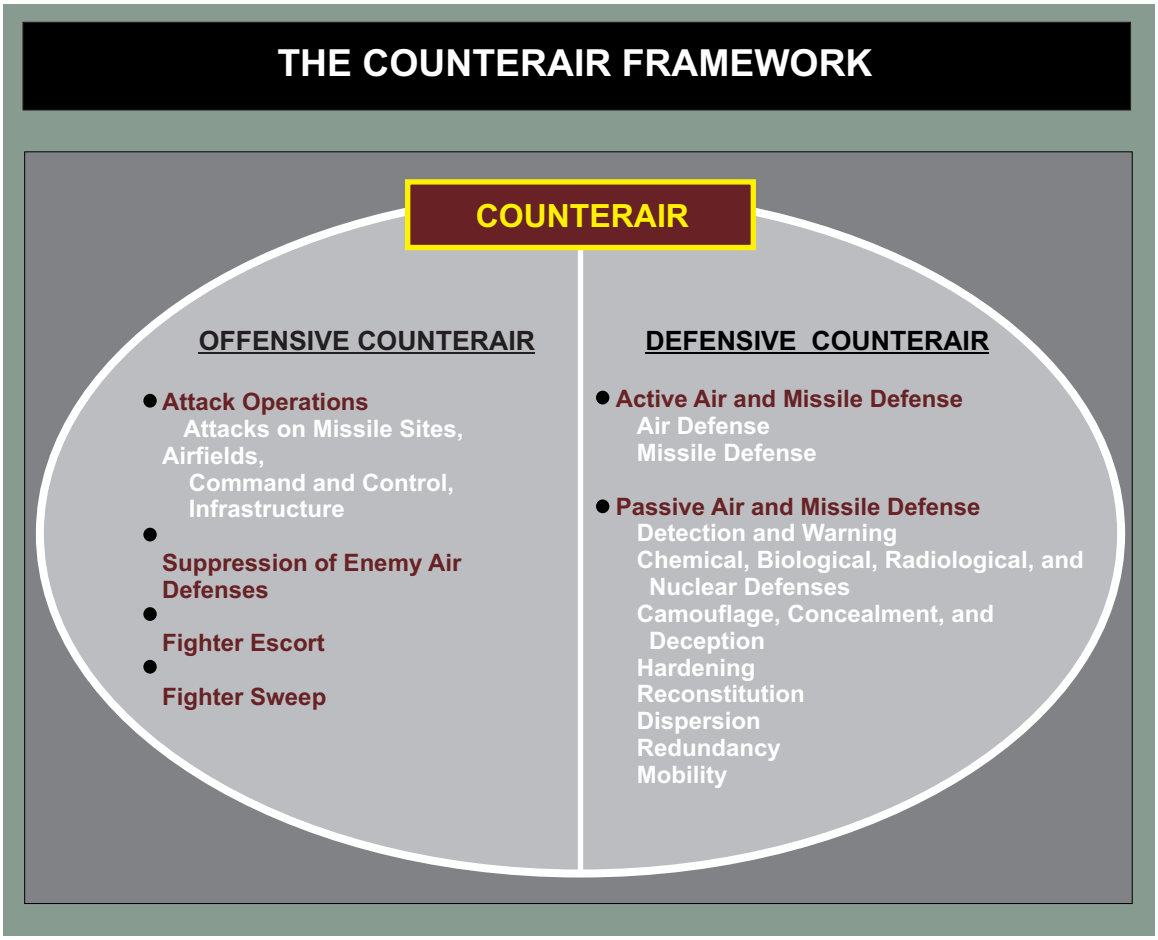

Figure I-1. The Counterair Framework

surface-to-surface missiles (SSMs), surface-to-air missiles (SAMs), air defense artillery (ADA), air-to-surface missiles (ASMs), SOF, and information operations (IO) to destroy or negate enemy aircraft and missiles, before and after launch (see Figure I-2). Generally, OCA operations seek to dominate enemy airspace and prevent the launch of threats, while defensive counterair (DCA) operations defeat enemy air and missile threats attempting to penetrate or attack through friendly airspace. Joint forces must be integrated to exploit the mutually beneficial effects of offensive and defensive operations to destroy, neutralize, or minimize air and missile threats. While theater missile (TM) defense is integral to success of counterair operations, rather than separating operations between countering missiles and aircraft, the counterair framework is based on integrating offensive and defensive operations against both aircraft and missile threats.

3. Offensive Counterair Operations

a. OCA is defined as "offensive operations to destroy, disrupt, or neutralize enemy aircraft, missiles, launch platforms, and their supporting structures and systems both before and after launch, but as close to their source as possible." The goal of OCA operations is to prevent the launch of enemy aircraft and missiles by destroying them and their overall supporting infrastructure prior to employment. This could mean preemptive action against an adversary.

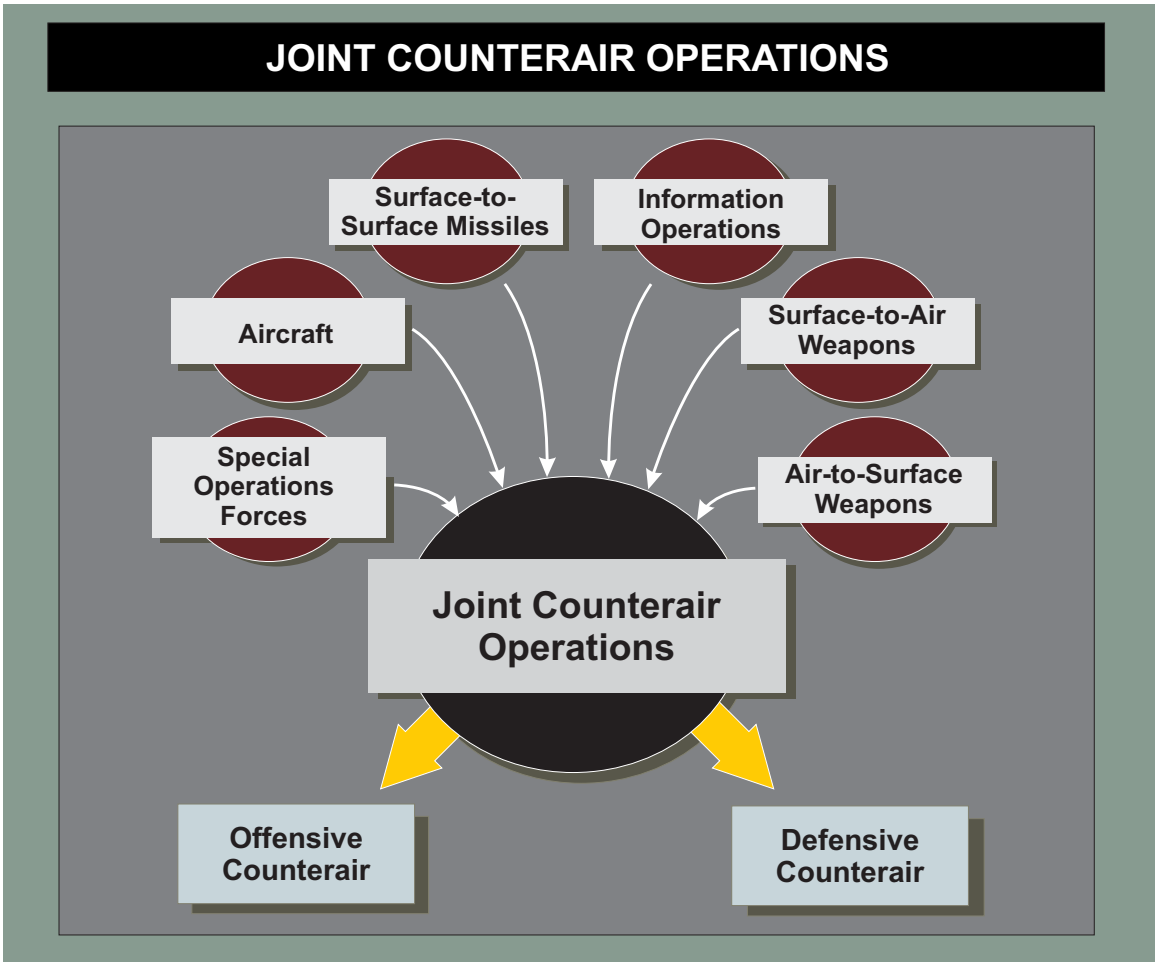

Figure I-2. Joint Counterair Operations

b. OCA operations are the preferred method of countering air and missile threats because they reduce the level of the threat that defensive forces must face. OCA operations range throughout enemy territory, generally are conducted at the initiative of friendly forces, and normally are a high priority as long as an enemy has the air and missile capability to threaten friendly forces and conduct aerial surveillance and reconnaissance in friendly airspace. OCA operations also include targeting those assets that directly or indirectly enable enemy airpower, such as petroleum, oils and lubricants, airfield facilities, missile reload and storage facilities, aircraft repair structures, command and control (C2) facilities, etc. OCA includes the four operations briefly described as follows:

(1) **Attack Operations.** Attack operations include targeting enemy air and missile forces on the surface and the infrastructure and systems that contribute to their capabilities. Some Services refer to these as "strike" operations.

(2) **Suppression of Enemy Air Defenses (SEAD).** Activity that neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive and/or disruptive means.

(3) **Fighter Escort.** Fighter escort includes providing dedicated protection sorties by air-to-air capable fighters in support of other offensive air and air support operations over enemy territory or in a DCA role to protect aircraft such as high value airborne assets (HVAAs).

(4) **Fighter Sweep.** Fighter sweep is an offensive mission by fighter aircraft to seek out and destroy enemy aircraft or targets of opportunity in a designated area.

Detailed discussions of these missions can be found in Chapter IV, "Offensive Counterair Planning and Operations."

OFFENSIVE COUNTERAIR IN THE DESERT

Each of the pilots of four F-15Cs from the 58th Tactical Fighter Squadron was flying his first combat mission on 17 January [1991], sweeping for Iraqi fighters. Around Baghdad, "The whole ground was red with Triple-A fire as far as you could see," recalled one pilot. The four F-15s were inbound toward Mudaysis airfield when two Iraqi Mirage F-1 fighters took off and headed for them at low level. Using the look down, shoot down radar capability, one F-15 fired an AIM-7 radar-guided missile and saw the F-1 explode. The Iraqi wingman, evidently startled by this disaster, created an even greater one for himself when he turned right and dove straight into the desert floor.

SOURCE: 58th TFS Unit History cited in DOD Final Report to Congress, *Conduct of the Persian Gulf War*, April 1992

4. Defensive Counterair Operations

DCA is defined as "all defensive measures designed to detect, identify, intercept, and destroy or negate enemy forces attempting to penetrate or attack through friendly airspace." DCA operations include both active and passive defense measures to protect friendly forces, critical assets, population centers, infrastructure, etc. The goal of DCA operations, in concert with OCA operations, is to provide an area from which forces can operate, secure from air and missile threats. DCA operations are conducted using both active and passive air and missile defense (AMD) measures. Since DCA operations employ weapon and sensor systems within the same airspace, these operations are subject to JFC-approved weapons control procedures and airspace control measures. DCA operations must be integrated with OCA operations and all other joint force operations.

Further discussion of responsibilities for developing weapons control procedures and airspace control measures can be found in Chapter III, "Counterair Planning."

a. **Active Air and Missile Defense.** Active AMD is direct defensive action taken to destroy, nullify, or reduce the effectiveness of air and missile threats against friendly forces and assets. It includes the use of aircraft, air defense weapons, missile defense weapons, electronic warfare

(EW), sensors, and other available weapons/capabilities. Ideally, integration of systems will allow for a defense in depth, with the potential for multiple engagements that increase the probability for success. Both air defense and missile defense are closely integrated to form an essential capability within DCA. While air defense "includes defensive measures designed to destroy attacking aircraft or missiles in the atmosphere, or to nullify or reduce the effectiveness of such attack," missile defense is recognized as unique because of the significance of the missile threat and the difficulty of the defense. Missile defense is defined as "defensive measures designed to destroy attacking enemy missiles, or to nullify or reduce the effectiveness of such an attack." AMD assets usually provide complementary and overlapping coverage. For example, while most DCA assets have the capability to defend against aircraft and cruise missile (CM) attack, fewer DCA assets have a capability to defend against theater ballistic missile (TBM) attack. However, of those DCA assets with a capability to defend against TBMs not all can also defend against aircraft and CMs. In general, while the term air defense includes aircraft and missiles, whenever appropriate in context, the term missile defense or air and missile defense should be used. Also, in addition to interceptions of enemy aircraft and missile attacks, active air defense missions include fighter escort for HVAAs.

b. **Passive Air and Missile Defense.** Passive AMD is all measures, other than active AMD, taken to minimize the effectiveness of hostile air and missile threats against friendly forces and assets. These measures include detection, warning, camouflage, concealment, deception, dispersion, and the use of protective construction. Passive AMD improves survivability by reducing the likelihood of detection and targeting of friendly assets and thereby minimizing the potential effects of adversary reconnaissance, surveillance, and attack. Passive defense measures are considered the same for AMDs with one exception: detection and warning of ballistic missile (BM) attack is normally provided by supporting assets from outside the theater/joint operations area (JOA), not local air control/AMD assets.

Further discussion of DCA can be found in Chapter V, "Defensive Counterair Planning and Operations."

5. Integrating and Synchronizing Joint Counterair Operations

a. Although OCA and DCA are considered separate operations, they must be mutually supporting to facilitate unity of effort. Many of the same forces may be required for both OCA and DCA operations, and early, continuous, and close coordination is required. Leveraging a mixture of capabilities from components bolsters the friendly force potential and likely will frustrate the enemy's ability to defend itself. Synchronization of OCA and DCA operations is vital to avoid duplication of effort and help prevent fratricide.

b. Considerations for integrating and synchronizing OCA and DCA:

(1) A single commander with an adequate C2 system should be responsible for both OCA and DCA operations.

(2) An interoperable, and robust C2 system from the JFC/joint force air component commander (JFACC) through the component commanders and down to the tactical units may be

required to facilitate the centralized planning and direction and decentralized execution normally required for counterair. The C2 system should be able to seamlessly flow information and warnings and to control assets from one mission/task to another, based on the daily requirements to support the JFC's operation/campaign. Communications architecture is a critical element for counterair due to the time-sensitivity of some targets. The C2 system must connect sensors to intelligence nodes and decisionmakers, and to operators throughout the battlespace.

(3) Commanders must integrate counterair capabilities and optimize the balance between OCA and DCA strengths and vulnerabilities. For example, destruction of BMs prior to their launch provides greater force protection than engaging them in flight. These prelaunch attacks must be planned and synchronized with the overall DCA scheme to maximize the effectiveness of resources.

c. Most units of the components of the joint force must rely on the defensive coverage provided by US Navy Aegis cruisers and destroyers and US Army air defense systems for TBM defense. Also, the theater counterair effort must be capable of coordinating and synchronizing its planning and actions with other theaters and worldwide integrating headquarters such as US Strategic Command (USSTRATCOM) and its subordinate Joint Functional Component Command for Integrated Missile Defense (JFCC-IMD).

Offensive counterair and defensive counterair operations use many of the same sensors, weapons, and command and control systems.

d. OCA and DCA operations require sharing many of the same systems (i.e., sensors, weapons, and C2), so integration of the component assets, as well as synchronization of their use is necessary for unity of effort.

6. Air and Missile Threats

a. Potential adversary air and missile threats continue to grow in numbers and capabilities. Expanded technology and proliferation of TMs, which include CMs, TBMs, and ASMs, expand the scope and complexity of protecting friendly forces and vital interests. The proliferation of WMD, coupled with a conventional means of delivery (i.e., aircraft, CMs, or BMs), greatly increases potential lethality of any adversary and elevates the importance of employing a robust counterair capability to protect US and friendly forces and areas.

b. Other trends also complicate the counterair mission. The detection capabilities, engagement ranges, mobility, and lethality of SAM systems and fighter aircraft have significantly increased. CMs and unmanned aircraft systems (UASs) also present elusive targets and will remain difficult to detect, identify, and engage.

c. Adversaries may employ area denial strategies designed to prevent the protected buildup of US forces. Most "anti-access" strategies today rely in some measure on the threat or employment of advanced aircraft and/or missiles that may be employed alone or in coordinated operations with other area denial capabilities. Targets may include attacks on the infrastructure supporting US power projection capability (e.g., seaports, airfields, and communications networks) or relevant military and political targets. In this environment, the use of WMD cannot be ruled out. Since nations can acquire modern TMs rather cheaply, **the number of countries with a small but lethal offensive missile capability will continue to increase.** The JFC also must assess the cross-theater BM threat from a state/non-state that possesses long-range missiles and may be aligned with the adversary.

d. Military aircraft and missiles also can be instruments of political coercion. Political targets include civilian population centers and government, cultural, and religious structures and locations. In addition, propaganda value exists in attacking US and multinational forces (MNFs) to show their vulnerability, particularly in rear areas.

e. For a given operation/campaign, proper assessment for counterair planning should take into account the possibility that **initial enemy attacks may employ TMs in conjunction with aircraft and unmanned aerial systems** against a variety of targets: ADA sites, C2 elements, communications nodes, air facilities, seaports, logistic centers, key civilian facilities such as power and water plants, nuclear delivery systems, storage sites, and industrial complexes.

7. Supporting Homeland Defense

a. There is no higher priority than the security and defense of the US homeland. Proliferation of advanced technologies for missiles, guidance systems, and WMD warheads have increased the potential missile threat to the homeland. There are potential adversaries with access to

WMD and potentially credible aircraft or missile delivery systems—such a threat will increase with time. This is significant because the predominant threat is not from a competing superpower, but more likely from the deliberate launch of a BM from a "rogue state," failed state, or terrorist group. Deterrence is not possible against some threats. Although this publication primarily focuses on countering theater air and missile threats (i.e., those affecting an overseas geographic CCDR's area of responsibility (AOR)/ a subordinate JFC's JOA), the concepts, activities, and capabilities discussed also apply to countering air and missile threats against the homeland.

b. The Commander, North American Aerospace Defense Command (CDRNORAD), is tasked to provide aerospace warning for North America that consists of the detection, validation, and warning of an attack against North America, whether by aircraft, missiles or space vehicles. CDRNORAD is also tasked to provide the aerospace control for North America that includes surveillance and control of Canadian and US airspace. The Commander, USSTRATCOM (CDRUSSTRATCOM) supports CDRNORAD by providing the missile warning and space surveillance necessary to fulfill the US commitment to the North American Aerospace Defense Command (NORAD) agreement. CDRUSSTRATCOM also provides integrated tactical warning and/or attack assessment of space or missile attacks on the continental United States and Alaska to the Commander, US Element NORAD, should CDRNORAD be unable to accomplish the assessment mission. CDRUSSTRATCOM provides the same warning and attack assessment for BM launches to the Commander, US Southern Command (CDRUSSOUTHCOM) for homeland defense of Puerto Rico and US Virgin Islands, the Commander, US Pacific Command (CDRUSPACOM) for homeland defense of Hawaii and US Pacific island territories, and to other geographic CCDRs worldwide.

Rapid proliferation of theater missiles expands the scope and complexity of protecting friendly forces and vital interests.

North American Aerospace Defense Command air patrol over Washington DC supporting homeland defense.

c. The Commander, US Northern Command (CDRUSNORTHCOM) is the supported commander for homeland defense within that AOR, minus the air and CM defenses for which CDRNORAD (or the Commander, US Element NORAD) is the supported commander in accordance with the NORAD Agreement, NORAD Terms of Reference, etc. CDRNORAD is currently allocated forces to conduct those missions by the Operation NOBLE EAGLE Execute Order. CDRUSNORTHCOM is responsible for air operations outside the scope of the NORAD agreements along with land and maritime defense within that AOR. CDRUSPACOM and CDRUSSOUTHCOM are responsible for defense of US homelands within their AORs including countering air and missile threats.

d. If offensive operations are necessary to protect the homeland, CDRUSSTRATCOM may provide global strike in complete coordination with a supported/supporting geographic CCDR, as directed by the President. Or, an overseas geographic CCDR (or subordinate JFC) may be tasked to support homeland defense by preemptive attack of hostile missile threats or DCA support after the launch of a hostile missile. Because of the time-sensitivity of a potential missile threat after launch, geographic and functional CCDRs should have plans/agreements with appropriate operating procedures for offensive operations overseas supporting AMD of the homeland and other friendly nations as may be directed by proper authority.

Refer to Joint Publication (JP) 3-27, Homeland Defense*, for additional discussion of homeland defense.*

8. Global Missile Defense

The proliferation of WMD and missile technology requires a global missile defense (GMD) capability for defense of the homeland and overseas theaters. The Unified Command Plan (UCP) tasks each CCDR with "Deterring attacks against the United States, its territories, possessions and bases, and employing appropriate force should deterrence fail." Each CCDR therefore becomes the "supported" commander for all operations aimed at defeating BM threats to the respective AOR. For TBM defense, a CCDR may control all elements involved. However, as the range of a threat missile increases, so too does the potential cross-AOR impact that it has. The links from sensors to decisionmakers to shooters must occur rapidly and reliably, often across traditional geographic and AOR boundaries. For example, a missile launch that crosses AOR boundaries complicates C2 of defensive assets and requires coordination amongst multiple CCDRs. The UCP established CDRUSSTRATCOM as the coordinating authority for planning and integrating GMD operations. All CCDRs (and their subordinate JFCs as applicable) coordinate their GMD planning and support with CDRUSSTRATCOM (JFCC-IMD).

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CHAPTER II
COMMAND AND CONTROL

"Our superiority in precision munitions, stealth, mobility and command, control, communications, and computers proved to be decisive force multipliers."

General H. Norman Schwarzkopf
Commander, US Central Command
1991

1. General

The growing capabilities of air and missile threats (speed, range, accuracy, stealth, lethality) and their proliferation require joint forces to be more responsive, flexible, and integrated in order to effectively counter those threats. The manner in which a JFC organizes forces directly affects their responsiveness and versatility. Based on the situation, the JFC normally tailors forces to the specific tasks to enable effective spans of control, responsiveness, tactical flexibility, and protection. Because the counterair mission can involve all components of the joint force, clear command relationships and properly assigned responsibilities are essential for effective and efficient operations.

SECTION A. COMMAND RELATIONSHIPS AND RESPONSIBILITIES

2. Command Relationships

a. The JFC organizes forces, establishes command relationships, assigns responsibilities, and promulgates necessary coordinating instructions. The organization should be sufficiently flexible to meet the planned phases of contemplated operations and any subsequent development that may require a change in plans. In operations of limited scope or duration, the JFC may organize and conduct counterair operations using the joint force staff (the operations directorate, [J-3]). If the JFC designates a JFACC, the JFC also normally designates the JFACC as the supported commander for the counterair mission. As a joint mission area, counterair is conducted by all components with the necessary capabilities, with the JFC/JFACC ensuring unity of effort, centralized planning and direction, and decentralized execution. The JFC determines the most appropriate command relationships for the component forces/capabilities made available for counterair. Regardless of the command relationship, all counterair forces are subject to the rules of engagement (ROE), airspace control, weapons control measures, and fire control orders established by the JFACC, area air defense commander (AADC), and/or airspace control authority (ACA) and approved by the JFC. Additionally, the AADC will be granted the necessary command authority to deconflict and control engagements and to exercise real-time battle management.

b. JFACCs, as functional component commanders, normally have operational control (OPCON) over only their own Service component forces and tactical control (TACON) or direct support of the other Service/functional component forces/capabilities made available for tasking. For example, air sorties made available for tasking normally are provided under TACON while surface-based AMD forces are provided in direct support with mission-type orders. Those

other component forces typically remain under the OPCON of their Service/functional component commanders. All command relationships (especially support relationships) between the JFACC, AADC, and other joint force component commanders must be clearly established by the JFC.

c. When the JFC organizes the joint force, in addition to a JFACC, the JFC also normally designates an AADC and an ACA. Normally, the JFC designates the JFACC as the AADC and ACA, because the three functions are so integral to one another. Those functions are described in this chapter, paragraphs 6b, 7, and 8, respectively.

(1) If the situation dictates, the JFC may designate an AADC and/or ACA separate from the JFACC. In that case, the JFC must clearly establish the command relationships of the JFC and the JFACC to the AADC and the ACA. The function of the ACA is integral to both the JFACC and AADC, so either may be designated the ACA, if not designated separately by the JFC.

(2) If the situation requires the JFACC, AADC, and ACA not be the same individual, close coordination among all is essential for unity of effort, synchronization/deconfliction of operations, and prevention of fratricide.

See JP 3-30, Command and Control of Joint Air Operations*, for details regarding the JFACC, AADC, and ACA; and JP 3-52,* Joint Doctrine for Airspace Control in the Combat Zone*, for additional details about the ACA and airspace control.*

3. Supported and Supporting Combatant Commanders

a. **Supported Combatant Commander.** The supported CCDR is designated by the Secretary of Defense in the appropriate warning/alert order. The supported CCDR may retain direct responsibility for the campaign or operation as a JFC or may designate a subordinate JFC, (a commander, JTF) to plan and execute it.

b. **Supporting Combatant Commanders.** In the same warning/alert order that designates the supported CCDR, the Secretary of Defense designates the supporting CCDRs based on their capabilities. Three typical supporting functional CCDRs are Commander, US Transportation Command, who supports force deployments and movements; CDRUSSTRATCOM who coordinates and integrates missile defense planning efforts to minimize operational seams across AOR boundaries, provides missile launch warnings, as well as space and strategic forces/capabilities; and Commander, US Joint Forces Command (CDRUSJFCOM), who provides US-based forces and capabilities to geographic CCDRs. A geographic CCDR also may be tasked as supporting commander. The latter may happen when a conflict is on or near the boundaries of adjacent geographic combatant commands and forces from a supporting CCDR will be attached to the supported CCDR. Another common example is federated intelligence support between CCDRs, as described in JP 2-01.3, *Intelligence Preparation of the Operational Environment*.

c. The supported CCDR in an overseas theater may concurrently be tasked for a supporting relationship with a functional CCDR or one of the geographic CCDRs with a homeland defense responsibility.

Refer to JP 0-2, Unified Action Armed Forces (UNAAF)*, for further information on command relationships and authorities.*

4. Joint Force Commander

a. Primary responsibilities of the JFC as they apply to joint counterair include the following:

(1) Develop and maintain a C2 system to unify the employment of subordinate forces in carrying out assigned counterair missions.

(2) Develop and produce joint operation plans (OPLANs) for joint counterair and airspace control or delegate authority to subordinate commanders.

(3) Establish appropriate command relationships for the component commanders.

(4) Define and assign operational areas within which subordinate joint forces will operate.

(5) Assign tasks, functions, and responsibilities to, and direct coordination among, the subordinate commands to ensure unity of effort in accomplishing joint counterair missions.

(a) Designate an AADC and approve an area air defense plan (AADP) developed by the AADC in conjunction with the joint force components. The AADP also may be integrated into a larger GMD plan developed by direction of the supported CCDR and in coordination with USSTRATCOM.

(b) Designate an ACA and approve the airspace control plan (ACP) developed by the ACA in coordination with the joint force components.

(c) Establish a theater air and missile warning architecture to share warnings with joint force components, allies, interagency entities, and HN agencies, as required by agreements.

(6) Establish, coordinate, and disseminate ROE to all subordinate commanders.

(7) A supported JFC normally designates a space coordinating authority (SCA) to coordinate joint space operations and integrate space capabilities. Based on the complexity and scope of operations, the JFC can either retain SCA or designate a component commander as the SCA.

b. The JFC's staff assists in the decision-making process. The staff's sole function is command support and its only authority is delegated to it by the JFC. The staff plans, monitors, advises, and coordinates the above listed JFC responsibilities. The JFC has the authority and latitude to organize the staff and assign responsibilities to ensure unity of effort and accomplishment of assigned missions (to include joint counterair operations). The composition of the staff normally reflects the composition of the joint force to ensure those responsible for employing joint forces have thorough knowledge of total force capabilities, needs, and limitations. Normally, each staff division is responsible for a specific area and is required to coordinate its actions, planning, and progress with other concerned divisions and agencies within the command. The primary staff divisions and their responsibilities are discussed in detail in JP 3-33, *Joint Task Force Headquarters*.

5. Service Component Commanders

a. The Service component commanders are responsible for making available to the JFACC those counterair forces/capabilities not required for their primary roles and tasks per the apportionment guidance by the JFC.

b. Service component commanders are responsible for passing warnings of air and missile attacks to their forces and for establishing the means of C2 for the decentralized execution of counterair operations. Some of the Service components are capable of establishing regional/sector air defense (AD) commands and providing the regional air defense commanders (RADCs)/sector air defense commanders (SADCs). The following are elements of the Service components that support counterair:

(1) **Army.** The commander, Army air and missile defense command (AAMDC), is the Army forces (ARFOR) operational lead for counterair operations who ensures the ARFOR contribution is properly planned, coordinated, integrated, and synchronized. The AAMDC provides a significant focus on countering adversary offensive air and missile capabilities, especially the TM threat. The commander, AAMDC, is normally designated the theater Army air and missile defense coordinator (TAAMDCOORD) for the theater Army commander or the joint force land component commander (JFLCC), if one is established. As approved by the JFC, the AADC may designate the commander, AAMDC as a deputy area air defense commander for air and missile defense (DAADC[AMD]) in support of the AADC for DCA operations. The AAMDC is responsible for balancing the Army counterair assets/capabilities between the Army/JFLCC maneuver units and the theater level requirements established in the JFC approved defended asset list (DAL) and the AADP. The AAMDC ensures that Army theater AMD operations are internally coordinated and properly integrated with the joint force and MNFs. The Army provides C2, sensors, and weapon systems for counterair, but does not provide the capability for regional/sector air defense commands within the land component AO. Regional/sector air defense commands are normally provided by C2 elements (control and reporting center [CRC], tactical air operations center [TAOC], or Aegis) of the other components.

(2) **Navy.** It is an inherent capability for the Navy forces (NAVFOR) to provide fleet AMD in accordance with their composite warfare command doctrine. DCA for maritime high value assets is

the responsibility of the air defense commander (ADC) who is normally deployed on an Aegis-equipped cruiser or destroyer. The Navy has an integrated AMD capability, and when directed, an ADC may function as a SADC/RADC. The Navy can provide a JFACC and/or an AADC, especially for maritime-centric operations such as an amphibious forcible entry operation. The Navy OCA capability can be employed theater-/JOA-wide, but their DCA capability is normally within the maritime area of operations (AO).

(3) **Marine Corps.** The Marine Corps forces (MARFOR) task organize as a Marine air-ground task force (MAGTF) that remains under the OPCON of the commander, MARFOR (COMMARFOR). The COMMARFOR makes OCA or DCA sorties available for counterair over MARFOR requirements and under TACON of the JFACC/AADC. MAGTF antiair warfare (AAW) assets vary according to the size of the force, but are primarily dedicated to protection of the MARFOR. MARFOR air assets are made available for counterair through the air apportionment decision. The MAGTF can provide a joint SADC for a limited scope operation utilizing their tactical air command center (TACC) and its subordinate elements.

(4) **Air Force.** Counterair is a primary function of the Air Force forces (AFFOR) during joint operations. The AFFOR can make available sensor systems, C2 systems, and weapon systems and is capable of providing one or more RADCs/SADCs throughout the JOA, including within the land component AO. The Air Force operates a number of air and space operations centers worldwide. For joint operations, one of these with suitable joint augmentation is capable of being used as a joint air operations center (JAOC). The commander, AFFOR (COMAFFOR) maintains centralized control of air operations through the Air Force air and space operations center and the daily air tasking order (ATO). Decentralized execution of the ATO is normally accomplished by subordinate air commanders using elements of the theater air control system (TACS). The CRC may be used as the core element for an air defense region/sector and can monitor/direct implementation of airspace control, identification (ID), and weapons control procedures. For a large-scale, extended campaign, the COMAFFOR may provide appropriate elements of the TACS (i.e., CRCs and the Airborne Warning and Control System [AWACS]) in support of joint air operations and counterair operations. If required, several CRCs may be provided to cover various operational areas within the JOA. AWACS may provide an initial TACS capability in the JOA until the CRCs are deployed and operational. The AWACS provides elevated sensors and radios for operational reach and in operations of a limited scope or duration can provide some of the functions of a CRC such as monitor/control airspace, ID, and weapons control procedures.

c. The Services support a complex array of air control/integrated AMD, air-ground, and C2 systems that are integrated into the airspace control system (ACS), theater air-ground system (TAGS), and integrated air defense system (IADS).

For more information on TAGS, see Field Manual (FM) 3-52.2/Marine Corps Reference Publication (MCRP) 3-25F/Naval Tactics, Techniques, and Procedures (NTTP) 3- 56.2/Air Force Tactics, Techniques, and Procedures (Instruction) (AFTTP[I]) 3-2.17, Multi-Service Tactics, Techniques, and Procedures for the Theater Air-Ground System (TAGS).

6. Functional Component Commanders

a. Functional component commands serve to ease the burden on the theater and JTF staffs, free the JFC to focus more on strategic aspects of the campaign, and provide individual air, land, maritime, and SOF headquarters for coordination with the other components. The JFC assigns responsibilities to and establishes command relationships among the functional component commanders, to include planning, organizing, coordinating, and executing functional area joint operations based on the JFCs concept of operations.

b. **Joint Force Air Component Commander.** The JFC will normally designate responsibility for counterair to a JFACC. Normally, the JFACC is the Service component commander having the preponderance of air assets and the capability to plan, task, and control joint air operations. The need for a JFACC is based on the JFC's overall mission, concept of operations, missions and tasks assigned to subordinate commanders, forces available, duration and nature of joint air operations desired, and the degree of control required for joint air operations. **The functions of the JFACC, AADC, and ACA must be integrated to ensure that joint air operations, OCA, DCA, and airspace control are fully integrated and synchronized.** The responsibilities of the JFACC, AADC, and ACA are interrelated and are normally assigned to one individual, but they may be assigned to two or more individuals when the situation dictates. Based on the situation, if the JFC decides not to assign the JFACC, AADC, or ACA as one individual, then close coordination between all three positions is essential.

(1) The JFACCs normally have OPCON over their own Service component forces and TACON or direct support of the other forces/capabilities made available to the JFACC for tasking. The JFACC generally uses centralized direction and planning with decentralized execution for counterair operations. This parallels the JFACC using centralized control with decentralized execution for joint air operations. These are not to be confused with the surface air defense control modes of centralized control, when higher echelon air defense units direct target assignments over their fire units, and the normal mode of decentralized control, when the higher echelon monitors fire unit actions, making direct target assignments to units only when necessary to ensure proper fire distribution or to prevent engagement of friendly aircraft.

(2) The responsibilities of the JFACC normally include, but are not limited to, joint air operations planning, coordinating, allocating, and tasking, based on the JFC's concept of operations and air apportionment decision. **Other responsibilities of the JFACC relating to joint counterair operations include the following:**

(a) Develop, coordinate, and integrate joint counterair planning with operations of other components for JFC approval.

(b) Make an air apportionment recommendation to the JFC, after consulting with other components and supporting commanders, which includes counterair, strategic attack, interdiction, and close air support.

(c) Provide centralized direction for allocating and tasking joint counterair capabilities and forces made available by the JFC.

(d) Provide IO strategies to neutralize enemy air and missile threats while preserving friendly offensive and defensive capability.

(e) Perform the duties of the AADC when directed by the JFC.

(f) Perform the duties of the ACA when directed by the JFC.

(3) The JFACC plans, directs, and executes counterair operations throughout the theater/JOA in accordance with JFC guidance and priorities. The JFACC normally is the supported commander for the JFC's overall counterair effort, and therefore determines the priority, timing, and effects of counterair fires throughout the theater/JOA. When the JFC designates land/maritime force commanders, they are the supported commanders within their designated AOs and they synchronize maneuver, fires, and interdiction within their AOs, to include prioritizing targets, effects, and timing of fires. The JFACC, as the supported commander for counterair throughout the theater/JOA, has the latitude to plan and execute JFC prioritized missions within a land or maritime AO in coordination with that land or maritime force commander.

(a) Although the JFACC normally has the latitude to plan and execute high-priority counterair operations and to attack targets within the land and maritime AOs, the JFACC must coordinate specific counterair operations with those component commanders to avoid adverse

Successful counterair operations require coordination, integration, and deconfliction with other component operations.

affects and fratricide. If counterair operations would have adverse effects within a component's AO, then the JFACC must adjust the plan, resolve the issue with that component commander, or consult with the JFC for resolution.

(b) The JFC may designate and prioritize certain time-sensitive targets (TSTs) that require immediate action whenever and wherever those TSTs are found. In doing so, the JFC has assessed and approved the higher risk for that priority target. **The JFACC, JFLCC, joint force maritime component commander (JFMCC), and joint special operations component commander must plan, coordinate, and rehearse how the JFACC will engage TSTs within the land and maritime AOs and the joint special operations areas.**

(4) A JAOC normally functions as the JFACC's principal operations center. It links with national and theater sensors, intelligence, communications, and component operations centers. The Service component commanders dual-designated as JFACCs will normally use the organic air operation center to form the core of the JAOC. Other component commanders normally will augment the JAOC. The success of the JAOC rests on the expertise of component liaisons such as the Army battlefield coordination detachment (BCD), naval and amphibious liaison element (NALE), Marine liaison officer (MARLO), the special operations liaison element (SOLE), and the AAMDC element. These liaison elements enhance coordination between the JFACC and their component commanders. The COMAFFOR (as a Service component commander or when the JFACC) normally will provide an air component coordination element (ACCE) as liaison to the land force component commander, and to the JFC or other component commanders as necessary to facilitate effective joint air operations and support. The ACCE represents its respective component commander on time-sensitive and critical issues. The component operations centers and liaison elements facilitate the planning, coordination, integration, and deconfliction of all joint counterair operations with other component operations.

(5) An IADS normally is established by the JFACC/AADC for DCA, and the JAOC normally would be the focal point of the IADS. The IADS is a robust integration of the Services' AMD capabilities and comprises sensors, weapons, communications networks, C2 systems, intelligence systems, and personnel. The IADS allows the JFACC/AADC to optimize mutual support with the strengths of the Services' capabilities while "covering" for their limitations.

Refer to JP 3-30, Command and Control for Joint Air Operations*, for more detailed information regarding the JFACC, the JAOC, and joint air operations.*

Refer to FM 3-01.15/MCRP 3-25E/NTTP 3-01.8/AFTTP(I) 3-2.31, Multi-Service Tactics, Techniques, and Procedures for an Integrated Air Defense System*, for additional details regarding an IADS.*

c. **Joint Force Land Component Commander.** The JFC normally designates a JFLCC when the land forces comprise two or more component forces (e.g., ARFOR and MARFOR) and a JFLCC will provide a better degree of centralized planning and direction for an expansive or complex land operation. The JFLCC, as a single commander for joint land operations, not only enhances synchronization of all land operations, but also provides forces/capabilities in

direct support of the counterair mission. While ARFOR and MARFOR maneuver units have organic air defense assets, they have different counterair capabilities. The MARFOR has organic fixed-wing aircraft capable of OCA and DCA operations, limited SAM capability, and armed rotary-wing aircraft capable of limited OCA operations. The ARFOR has armed rotary-wing maneuver units and ground based air defense units effective against theater missiles and aircraft, but no fixed-wing air defense aircraft. The ARFOR also has the Army Tactical Missile System for a short to medium range offensive capability that could be used in support of OCA.

(1) The MAGTF normally has an aviation combat element (ACE) sized to support their ground combat element. The ACE has fixed- and rotary-wing assets with air control and C2 assets. The MAGTF can support both OCA and DCA operations. The MAGTF normally makes aircraft sorties available for counterair tasking under TACON to the JFACC/AADC. The MAGTF commander's air defense battle manager is a SADC whose authority is determined by the ACE commander. The MAGTF air control assets while supporting the ACE are normally part of the joint force IADS, and if sized to the mission, can function as a sector air defense command.

(2) As discussed previously, the Army component provides an AAMDC integrating the operational elements of active air defense, passive air defense, attack operations, and C2 systems and intelligence to synchronize Army contributions to counterair operations. Normally, the AAMDC is OPCON to the JFLCC and in direct support of the JFACC. The AAMDC conducts split-based operations to provide the necessary support and deploys liaison teams to major theater C2 headquarters to ensure integrated and synchronized operations. The AAMDC also commands all Army theater-level AMD forces.

d. **Joint Force Maritime Component Commander.** The NAVFOR component of a JFMCC normally has a robust integrated, organic air and missile defense system. The NAVFOR/JFMCC makes aircraft sorties available for counterair tasking under TACON of the JFACC/AADC and can provide a sector/regional air defense command based on an Aegis ship. The MARFOR may be part of the JFMCC for maritime operations such as an amphibious forcible entry operation. Once established as a land force, the MARFOR may remain a Service component force, or may become part of a JFLCC.

e. **Joint Force Special Operations Component Commander (JFSOCC).** The JFSOCC may be designated a commander, joint special operations task force (JSOTF). The JFSOCC can provide OCA support through employment of some of their core tasks such as direct action, special reconnaissance, unconventional warfare, and IO, normally in enemy territory. These core tasks represent the collective capabilities of all SOF rather than those of any one unit. Normally, the JFSOCC has no capability to support DCA outside of self-defense. The JFSOCC normally provides a SOLE to the JFACC at the JAOC and a special operations C2 element to the JFLCC.

7. Area Air Defense Commander

a. The JFC designates an AADC with the authority to plan, coordinate, and integrate overall joint force DCA operations. The AADC normally is the component commander with the preponderance of AMD capability and the C2 and intelligence capability to plan, coordinate, and execute integrated AMD operations, including real time battle management.

b. Normally, for a large operation/campaign, the AADC will establish an IADS through the comprehensive integration of all available component C2 systems and DCA capabilities/assets. In the interest of decentralized execution, the AADC and RADCs/SADCs should be granted the necessary command authorities to synchronize/deconflict and control engagements and to exercise battle management.

c. The JFC will define the command relationships between the AADC and other joint force component commanders. Components will provide representatives, as appropriate, to the AADC's headquarters to provide both specific weapon systems expertise and broader mission expertise. If the JFACC is the AADC, or they are collocated, those representatives normally are within the same liaison elements provided to the JAOC (BCD, AAMDC, NALE, MARLO and SOLE). **If the AADC is not located at the JAOC, then appropriate liaison elements will be required from the Service/functional components.**

d. With the support of the component commanders, **the AADC develops, integrates, and distributes a JFC-approved joint AADP**. A critical feature of a joint, integrated plan is a common operational picture (COP) (i.e., a fused and correlated air, ground, and maritime picture) available in all supporting C2 facilities.

(1) The plan also should contain detailed weapons control and engagement procedures for all DCA weapons systems and forces integral to DCA operations.

(2) The plan should be closely integrated with the ACP through the ACA.

(3) The AADP should include IO measures and actions supporting counterair operations.

e. Primary responsibilities of the AADC include the following:

(1) Develop, integrate, and distribute a JFC-approved joint AADP.

(2) Develop and execute, in coordination with the intelligence directorate of the joint staff (J-2), J-3, communications system directorate of the joint staff (J-6), and joint force components, a detailed plan to disseminate timely air and missile warning and cueing information to components, forces, allies, coalition partners, and civil authorities, as appropriate. Planning for BM defense should include coordination for launch warnings, attack assessments, and other aspects of missile defense, either through the supported CCDR or directly with USSTRATCOM, if authorized.

(3) Develop and implement, in coordination with the component commanders and with JFC approval, ID and combat ID (CID) procedures and authorities, and engagement procedures that are appropriate to counterair.

(4) Establish timely and accurate track reporting procedures among participating units to provide a COP.

(5) Perform the duties of the ACA when directed by the JFC.

(6) Establish air defense sectors or regions, as appropriate, and designate RADCs/SADCs to enhance decentralized execution of DCA operations.

(7) Establish appropriate joint, fighter, and missile engagement zones (MEZs) in coordination with the RADCs/SADCs and the ACA.

(8) Appoint DAADC(AMD)s as required, to advise on how to integrate and synchronize their Service component DCA capabilities/assets for complex DCA plans and operations.

(9) Ensure all support assets, including surface-based and space-based early warning systems, are fully coordinated to support DCA operations.

(10) Make DCA recommendations to the JFC/JFACC after consultation with DCA representatives from the joint force components. The AADC should prioritize those desired effects and objectives that may be achieved through the OCA efforts to counter the air and missile threats.

f. **DAADC(AMD).** When a significant portion of the DCA capability is contributed by a component other than that of the AADC, a senior officer from that component may be designated by the JFC or AADC as a DAADC(AMD). DAADC(AMD) responsibilities include assisting in AADP development, integrating respective component and multinational AMD into DCA operations, and advising on ROE, airspace coordinating measures (ACMs), weapons control measures, air defense warnings (ADW), and respective component AMD operations and capabilities. As the senior Army air defender, the commander, AAMDC normally assumes the role of a DAADC(AMD) and advises the AADC on the best distribution of the Army AMD capabilities between the requirements for the theater level DAL (previously known as echelon above corps) and maneuver forces of the ARFOR/JFLCC. As a DAADC(AMD), the commander, AAMDC will deploy personnel and equipment to the JAOC. Similarly, the NAVFOR and MARFOR should be prepared to assign an equivalent position (e.g., Navy ADC or Marine Corps sector air defense coordinator, respectively) as a DAADC(AMD) when their air defense expertise is required by the AADC/JFACC.

Note: The Army BCD normally deployed to the Air Force air and space operations center or the JAOC is only a liaison element. Although the BCD has an air defense section, responsibility to integrate the ARFOR AMDs resides with the senior ADA commander, normally the commander, AAMDC.

g. **RADC/SADC.** During complex operations/campaigns conducted in a large theater of operations, the AADC may recommend and the JFC may choose to divide the JOA into separate air defense regions, each with a RADC who could be delegated responsibilities and decision-making authority for DCA operations within the region. The AADC and RADC, as approved by the JFC, may choose to further divide regions into sectors, each with a SADC with appropriate authority for their responsibilities. Generally, the regions/sectors are based on geographic size and obstacles/features overland. The open-ocean and littorals normally are part of a maritime region and the RADC/SADC may be afloat, so its complete integration with the bordering land-based RADC/SADC and the AADC is essential to prevent a seam in the IADS. **The core of a RADC/SADC is a Service component air control organization with radar and necessary C2 links upward to the AADC/JFACC/JFC, down to the tactical units' operation centers, and laterally to other RADCs/SADCs.**

(1) The maritime component (NAVFOR/JFMCC) normally has the open-ocean and littorals as a region with a Navy ADC on an Aegis ship. Over land, there may be numerous RADCs/SADCs, normally operated by the Air Force or the MARFOR. The Air Force usually has a preponderance of capability because of its role in controlling air operations over land. The role of the Army does not require a capability to operate a RADC/SADC nor an air-to-air DCA capability. Similarly, the Air Force does not have a surface-to-air defensive capability.

(2) The AADC also may delegate certain planning functions to a RADC/SADC concerning the deployment of air and surface DCA assets. In all cases, the AADC should establish clear guidance concerning the responsibilities and authorities delegated to the RADC/SADC.

(3) Each RADC/SADC with a surface-based AD requirement/capability must have that expertise on staff and the requisite C2 links. For a Navy/maritime component the integration of air-to-air and surface-to-air capabilities is organic to established fleet air defense. The MAGTF also has an integrated organic AD capability. The Air Force must rely on Army augmentation/liaison for surface-to-air expertise. A Navy or Marine Corps RADC/SADC should have that Army expertise as a liaison if they rely on an Army air/missile defense capability within their region/sector. Additionally, if a ground-based RADC/SADC is being supported by a Navy/JFMCC surface-based air/missile defense system (e.g., Aegis-equipped ship), then an equivalent Navy AD specialist should augment or be liaison to that RADC/SADC.

(4) Army Air Defense Artillery Fire Control Officer (ADAFCO). An ADAFCO is required in any regional/sector air defense command in which an Army AMD capability is employed. The ADAFCO is responsible for coordinating Army AMD for designated assets/areas on the DAL in that region/sector and for coordinating and monitoring the tracking and engagement activities of individual Army AMD fire units. The ADAFCO is the AMD engagement operation subject matter expert to the RADC/SADC on what course of action (COA) Army AMD units would likely follow during any situations, especially with degraded communications, and what limitations ROE can have on autonomous Army AMD units, what tactics may be more effective, etc. ADAFCO elements should be part of/liaison to any Service component AMD operations centers that may have control of or support from Army AMD assets. Typically, an

ADAFCO element deploys to the appropriate AD region/sector location and is responsible to the RADC/SADC for integrating Army AMD capabilities into that part of the IADS. The ADAFCO element should be capable of continuous (24-hour) operations as the single point of contact between the AMD fire direction centers and the RADC/SADC, and normally is placed under the direct control of the senior weapons director, mission crew commander, etc. The ADAFCO must have access to dedicated AD communication links (e.g., dedicated AD voice circuit) with Army AD C2 nodes when conducting active air defense operations. Normally, an ADAFCO should not be placed on an airborne warning and control/airborne C2 aircraft that is not designated as a fulltime SADC directing ground-based AD in conjunction with active air intercepts. Those air control type aircraft normally lack a dedicated seat position and communications for the ADAFCO. However, some operations may require ADAFCO support on those aircraft, so the Army and air component planners must anticipate and properly coordinate for that requirement to ensure effective use of the available ADAFCO assets.

8. Airspace Control Authority

a. The JFC designates an ACA (normally the JFACC) who has overall responsibility for establishing and operating the ACS. The ACA also develops policies and procedures for airspace control that are incorporated into an ACP and promulgated throughout the theater/JOA. A key responsibility of the ACA is to provide the flexibility needed within the ACS to meet contingency situations that necessitate rapid employment of forces.

b. The ACA coordinates use of airspace through the ACP, including integration with the HN ACS, and synchronizes/deconflicts all user requirements using the airspace control order (ACO). The ACA must be able to rapidly implement ACMs in the dynamic counterair environment to enhance freedom of action of components while preventing fratricide. The ACP is implemented by the ACO and all component forces that affect joint air operations are subject to the ACO. However, this control of airspace by the ACA does not imply any type of command authority (OPCON or TACON) over any air asset.

c. The ACA responsibilities for counterair operations include, but are not limited to:

(1) Link the ACP to the AADP when designating volumes of airspace.

(2) Develop ACMs that support and enhance operations.

(3) Provide a flexible ACP that can adapt to changing requirements of the tactical situation.

Refer to JP 3-52, Joint Doctrine for Airspace Control in the Combat Zone*, and JP 3-30,* Command and Control for Joint Air Operations*, for more details concerning the ACA, JFACC, and AADC.*

SECTION B. MULTINATIONAL CONSIDERATIONS

9. General

Most joint operations are now conducted within a multinational context (i.e., an alliance or coalition). Each MNF operation is unique, and the international situation, along with the perspectives, motives, and values of each MNF member may vary. The JFC (who may be the MNF commander [MNFC]) must evaluate key considerations and differences involved in planning, coordinating, and conducting counterair operations in a multinational environment. A major characteristic of operating in the multinational environment is that consensus through compromise is often essential to success. Within designated command authorities and in close coordination with the civilian leadership, the MNFC may have responsibilities to both national and foreign leaders and must be prepared to negotiate with MNF partners when planning and developing ROE, ACMs, weapon control measures, and other appropriate procedures and processes such as CID.

10. Command Relationships

a. The traditional command relationships used by US forces generally may not be possible with all MNF partners because of political necessity. Some MNF partners may accept US command authorities; others may not. In MNF operations, understanding the agreed upon command relationships and the related command authorities are key to developing the desired unity of effort for counterair operations.

b. The JFC should strive for documented relationships such as memorandums of agreement and/or status-of-forces agreements to articulate not only command relationships but collateral support requirements (e.g., security and logistics) between US and MNF members conducting counterair operations.

c. The JFC must be aware that many different interpretations of OPCON and TACON exist among MNF partners, and all must ensure complete understanding of the terms early during the planning of the operation. The JFACC/AADC may expect no more than TACON over MNF counterair units/capabilities, and very likely, may have simple support relationships based on mission-type orders.

Refer to JP 3-16, Multinational Operations*, for more details on organizing alliance and coalition command structures and headquarters.*

11. Organization

a. No matter how the MNF is organized, the organizational structure and command relationships must be clearly understood by all commanders and supported by the C2 capability.

b. Some significant organizational considerations affecting counterair include force capabilities and disparities, information and equipment security, unit procedural and organizational differences, cultural differences, language barriers (including differing use of common terms), and

interoperability of the C2 systems of the MNF components. See Figure II-1 for a listing of some principle factors affecting national military capabilities.

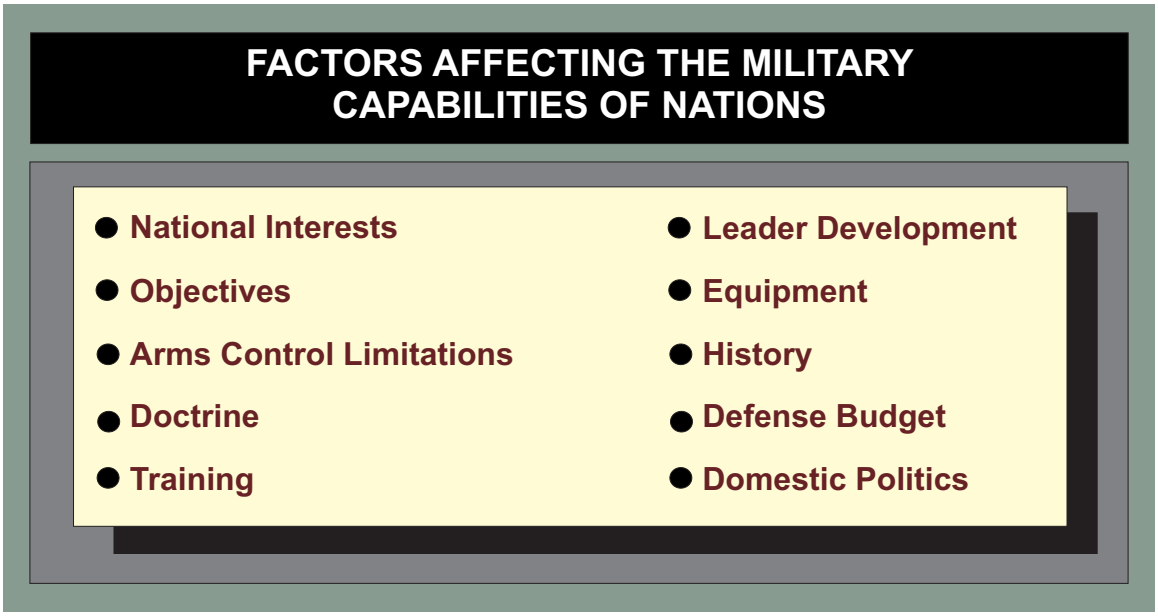

Figure II-1. Factors Affecting the Military Capabilities of Nations

(1) Each nation normally establishes a national center or cell as a focal point to ensure effective support and control of its forces, to include counterair forces.

(2) National intelligence systems should be integrated to ensure responsiveness to counterair operational needs. Because sharing intelligence and warning information is vital to unity of effort, any issues related to the release of intelligence information and products to MNF partners must be resolved early during planning. At all levels, the senior US officer needs to be concerned with the issues of intelligence sharing and releasing of information early in the process in order to ensure the commander's requirements have been clearly stated and understood.

(3) Some nations are particularly sensitive to certain force protection measures (use of flares, security patrols by national forces other than their own, arming of force protection personnel, limiting access of airfield support personnel to aircraft, etc.) These issues should be coordinated ahead of time, and agreements must be continually updated as situations warrant.

(4) Before assigning tasks to MNF units, the JFACC/AADC should ensure that all elements can make meaningful contributions to the overall counterair mission. Some partners may be restricted to the types of targets they are permitted to attack and the level of risk they are willing to accept due to domestic politics, arms limitation agreements, or their capabilities.

c. All critical forces and geopolitical areas should receive adequate protection from air and missile threats. Some MNF partners are not uniformly capable of defending against air and missile threats and may require DCA assets from another theater or nation.

d. **The JFACC/AADC should consider using liaison officers to assess and/or assist MNF partners' counterair capabilities and to maintain span of control and keep forces connected at the tactical level.** Also, depending upon the makeup of the MNF, the need for interpreters should be considered.

See JP 3-0, Joint Operations*, and JP 3-16,* Multinational Operations*, for further detail concerning multinational operations.*

SECTION C. COMMAND AND CONTROL SYSTEMS AND FUNCTIONS

12. General

Joint counterair operations require reliable C2 capabilities that allow the JFC/JFACC/AADC and component commanders to integrate and synchronize/deconflict OCA and DCA operations. Effective C2 systems facilitate centralized planning and direction and decentralized execution, helping commanders to synchronize geographically separated operations into a unified effort. C2 systems must support preemptive or responsive OCA operations; while at the same time detecting, identifying, and tracking threats in order to warn, cue, and coordinate DCA assets, including providing accurate warnings of enemy missile launches and impact points.

Refer to JP 6-0, Joint Communications System*, for details regarding planning communications systems for joint operations.*

13. Requirements, Infrastructure, and Resources

a. **Requirements.** The C2 systems should be capable of rapidly exchanging information, interfacing among components, and displaying a COP to all participating components. The information flow should be as complete, reliable, secure, and as near real time as possible to support commanders' decision cycles. These systems should be flexible enough to allow near real time retasking and coordination for attacks on TSTs. The C2 architecture among all levels of command should be survivable, interoperable, flexible, secure, and redundant to the maximum extent possible. C2 integration includes communications and data links for sensors, weapons systems, staffs and liaisons, and supporting agencies. Effective C2 systems support unity of effort during counterair operations by enabling commanders to fuse disparate databases and geographically separated offensive and defensive operations into a single COP that enhances situational awareness and understanding. For every operational element involved in counterair the C2 family of systems must support the following:

(1) Rapid communications and coordination links and procedures.

(2) Data fusion and decision-making nodes.

(3) Warning and cueing systems.

(4) Links to dedicated weapons systems, other MNF partners and/or civilian authorities.

(5) Vertical, horizontal, technical, and procedural interoperability. **Counterair C2 processes are built using existing joint and Service systems and capabilities.**

b. **Infrastructure.** The C2 infrastructure should consist of interoperable systems that provide complete coverage for an integrated diverse force spread across a theater/JOA including considerations for any MNF assets. The systems will include large, fixed site C2 facilities, small remote relay sites, mobile land and maritime sites, and airborne systems. These systems should be connected to commanders at appropriate decision and execution levels to integrate forces and missions. The C2 architecture provides the timely intelligence and operational information needed to plan, employ, coordinate, deconflict, execute, and sustain joint counterair operations. These systems also facilitate the integration of counterair with other joint operations via rapid communications among commanders, staffs, sensors, weapon systems, and supporting agencies.

(1) Part of that infrastructure is the TAGS, a system of the various component air-ground systems integrated for planning and execution of air-ground operations. The TAGS consists of an overarching joint C2 architecture and Service coordination links. It is not a formal system in itself but rather the sum of the component air-ground systems operating in the theater. It is applicable to all theater operations to include air, ground, maritime, and amphibious operations.

Refer to FM 3-52.2/(FM 100-103-2)/MCRP 3-25F/NTTP 3-56.2/AFTTP(I) 3-2.17, Multi-Service Tactics, Techniques, and Procedures for the Theater Air-Ground System*, for detailed discussion of the TAGS, and the Service component contribution to the infrastructure.*

(2) The IADS is another part of the infrastructure that is not a formal system, but an integration of numerous systems that includes not only C2, but sensors, weapons, etc. Although primarily for DCA operations, some components of the IADS infrastructure and C2 architecture comprise a component of the TAGS.

Refer to FM 3-01.15/MCRP 3-25E/NTTP 3-01.8/AFTTP(I) 3-2.31, Multi-Service Tactics, Techniques, and Procedures for an Integrated Air Defense System*, for details regarding the IADS.*

c. **Resources.** Service components, the JFSOCC, and specialized joint communications elements provide the core of the communications capabilities for C2 for the joint force. The following summarize some of those capabilities that contribute to C2 for various aspects of counterair:

(1) **Air Force C2.** The Air Force TACS provides resources for a C2 infrastructure that can support the AFFOR or joint operations. The TACS includes the following elements that function under the tenets of centralized control and decentralized execution for joint air operations.

(a) The Air Force air and space operations center is the senior air operations element of the TACS with the primary function of planning, directing, coordinating, and controlling air operations. It is capable of operating as a JAOC for the JFACC.

(b) The CRC, as a worldwide deployable airspace control and battle management platform, is employed at the tactical level to support air operations planning and execution across the entire range of operations. The CRC operates independently or in combination with other tactical C2 elements (e.g., Joint Surveillance Target Attack Radar System [JSTARS], the air support operations center [ASOC], and AWACS). It supports horizontal integration with tactical resources and vertical integration with the Air Force air and space operations center. A CRC is capable of being a regional/sector air defense center.

(c) The ASOC plans, coordinates, and directs air support for land forces, normally at corps level and below. It is directly subordinate to the Air Force air and space operations center and is responsible for the integration of air operations within its assigned corps sector to include close air support, air interdiction, air surveillance, reconnaissance, and targeting, SEAD, theater airlift, and personnel recovery.

(d) JSTARS E-8C aircraft provide near real time surveillance and targeting information on moving and stationary ground targets, slow-moving rotary and fixed-wing aircraft, and rotating antennae. These surveillance platforms also provide attack support to friendly offensive air elements in all ambient light and weather conditions. Based on the JFC's objectives, JSTARS supports the JFLCC's scheme of maneuver as well as the JFACC. JSTARS is considered a HVAA.

(e) AWACS E-3B/C aircraft is a C2 platform with organic sensors that provides battle management and air surveillance functions, that includes airspace management, identifying and tracking friendly aircraft, detecting, identifying, and tracking enemy air threats for early warning and air defense purposes; and supports execution of the ATO. AWACS works directly with other Services' AD aircraft and SAM units supporting the joint defense against air breathing and BM threats. An AWACS may be designated as a SADC if a CRC or other ground-based C2 node is not in the JOA/AOR. This is usually a short-term solution until a CRC deploys into theater, or if an operation is of limited scope or a short duration. AWACS is considered a HVAA.

(2) **Army C2 Agencies.** The Army air-ground system (AAGS) is the control system for synchronizing, coordinating, and integrating air operations with an Army land force commander's scheme of maneuver. The AAGS initiates, receives, processes, and executes requests for air support and disseminates information and intelligence produced by aerial assets. Although some elements within AAGS (such as the tactical air control party [TACP]) belong to different Services or other nations, they function as a single entity in planning, coordinating, deconflicting, and integrating air support operations with ground operations. The Army elements of the AAGS consist of: operations, fire support, air defense, C2, and coordination/liaison elements. The Army may utilize fire support elements of one form or another, depending on the size of the organization, for planning, execution and coordination of joint fires, and fire support within the Army/JFLCC AO. **These elements can support OCA operations by advising the Army unit commander/JFLCC on capabilities and the effective use of assets and by assisting in the planning and coordination of attacks of OCA targets within the AO.**

(a) **Battlefield Coordination Detachment.** The Army provides a BCD as the interface for selected battlefield functions between the ARFOR/JFLCC and the AFFOR/JFACC. Typically, a BCD is collocated with the JAOC. **The BCD supports OCA operations by advising the JFACC/JAOC on the capabilities and effective employment of ARFOR systems.** The BCD passes JFACC requests for ARFOR/JFLCC support for OCA. The BCD assists in the synchronization of joint air operations with Army/JFLCC maneuver and fires and the exchange of operational and intelligence data.

(b) **AAMDC.** For OCA, the AAMDC, through its attack operations cell, plans, analyzes, tracks, develops, and nominates enemy air and TM targets. The AAMDC should collocate with, or nearby the JAOC, or provide a liaison element to the JFACC. For DCA, the AAMDC is the senior air and missile defender for both the theater Army commander/JFLCC (as the TAAMDCOORD) and the AADC (as the DAADC[AMD]).

For more information on Army fire support C2 agencies, see JP 3-09, Joint Fire Support.

(3) **Navy Tactical Air Control System (NTACS).** NTACS is the principal air control system afloat. The senior Navy air control agency is the Navy tactical air control center (TACC) and the subordinate airborne element is the E-2 Hawkeye aircraft. The Navy TACC is responsible for planning and conducting naval air operations as well as coordinating operations that affect airspace. If the JFACC's command operations center is afloat, the Navy TACC may support operations as the JAOC. The link between the JFACC and naval commanders is the NALE located in the JAOC. The NALE assists in integrating naval air capabilities (to include counterair capabilities) to help the JFACC meet JFC objectives through the NTACS.

(4) **The Marine Air Command and Control System (MACCS).** The MACCS provides the Marine ACE commander with the capability to C2 and influence the application of Marine aviation assets. The Marine air command and control agencies involved in OCA are the TACC and the TAOC.

(a) The TACC is the senior agency for the ACE commander and battlestaff to plan, command, supervise, and direct MAGTF air operations. The TACC maintains complete information on the friendly situation, including an integrated air picture with ground combat information essential to the air effort. It can provide automated displays, ATO generation equipment, and data link feeds. Functionally, it is divided into four mutually supporting sections: current operations, future operations, future plans, and air combat intelligence. The current operations section executes and assesses the daily ATO, while the future operations section helps develop future ATOs and operation orders for the ACE. The future plans section conducts aviation planning in support of the next mission, or potential mission, assigned to the MAGTF. The air combat intelligence section supports the entire tactical air command center by producing and disseminating aviation-specific, all-source intelligence required to plan and execute air operations, to include counterair operations. The TACC can provide a sector air defense center for limited scope operations using the TAOC and subordinate elements.

(b) The TAOC is the principal air defense agency in the MAGTF. Subordinate to the TACC, the TAOC provides real time surveillance, direction, positive control, and navigational assistance

Airborne warning and control aircraft assists in the synchronization of defensive counterair operations.

for friendly aircraft. It performs real time direction and control of all AAW operations, including manned interceptors and surface-to-air weapons.

(c) The MARFOR normally provides a MARLO to the JAOC to serve as the Service conduit to the JFACC/AADC.

(5) The SOF under a JFSOCC (or a commander, JSOTF designated for an operation) have their own joint force C2 architecture and are linked to and a part of the JFC's C2 architecture. The commander, JSOTF, has at least one secure dedicated C2 network for their operations and other networks with the SOF Service components. Although SOF can play a significant role in OCA operations and they may share common operational areas with the JFACC (both routinely operate deep in enemy territory), the SOF only control their own operations or operations in which they are the supported command. The SOF have no capability for DCA. Therefore, SOF aviation and surface activities must be closely coordinated with all other joint operations, from planning through execution, to provide synchronization/deconfliction and to prevent fratricide. The SOLE serves as the JFSOCC's representative to the JFACC and coordinates, deconflicts, and integrates all SOF air and surface activity into the ATOs and ACOs.

(6) **Joint Interface Control Officer (JICO).** The JICO is the senior interface control officer in support of the joint multi-tactical data link network (MTN) operations within the theater/JOA. The JICO is responsible for planning and managing the architecture and technical integration of joint data and communications systems for the MTN. The MTN components are the tactical data links (TDLs) such as Link 11, Link 11B, Link 16, etc. The JICO controls and

acts as the coordinating authority for the joint interface control cell (JICC) and for any regional interface control officer (RICO)/sector interface control officer (SICO) for planning and executing TDL functions that cross regional and/or sector boundaries or impact the theater-wide MTN. When a JTF is formed, there will be only one JICO per JTF, and the JICO will normally be located in a C2 facility with connectivity to the primary TDLs (normally the JAOC). There may be Service component interface control officers located at the JICC.

(a) When regional/sector AD commands are established, the JICO will coordinate with the RICOs/SICOs designated for those commands. The RICO/SICO coordinates with the JICO but is responsible to the RADC/SADC for TDL continuity at their level. RICOs/SICOs may require interface control cells depending upon the complexity of their TDL networks. See Figure II-2 for a depiction of that notional MTN interface control structure.

(b) The JICO is responsible to the joint data network operations officer (JDNO) for the MTN, which is one of four networks in the joint data network (JDN). In turn, the JDNO is responsible to the JFC for integration of information from the sub-networks into a common track database used to generate the common tactical picture (CTP). The JDN is the primary feed to support generation of the CTP. The CTP and information from the Joint Planning Network contributes to the COP.

Refer to Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3115.01, Joint Data Network (JDN) Operations*, and CJCSM 6120.01,* Joint Multi-Tactical Data Link (TDL) Operating Procedures*, for full details regarding the JICO and JDN and TDL operations.*

> *"When we started our deployment, we had only the most rudimentary communications infrastructure in Southwest Asia and the challenge of distance was daunting. Thanks to good planning and our understanding of the importance of satellites, we quickly and smoothly transitioned to a mature tactical theater network."*
>
> **General Colin L. Powell, CJCS**
> **December 1990**

14. Situational Awareness

a. A primary objective the staff seeks to attain for the commander and for subordinate commanders is **situational awareness — a prerequisite for commanders to understand and anticipate counterair opportunities and challenges**. In simplest terms, this results in the ability "to see first, understand first, and act first" across the full range of military operations. True understanding should be the basis for information provided to commanders in order to make decisions. Knowledge of friendly capabilities and enemy capabilities, intentions, and likely COAs enables commanders to focus joint counterair efforts where they best and most

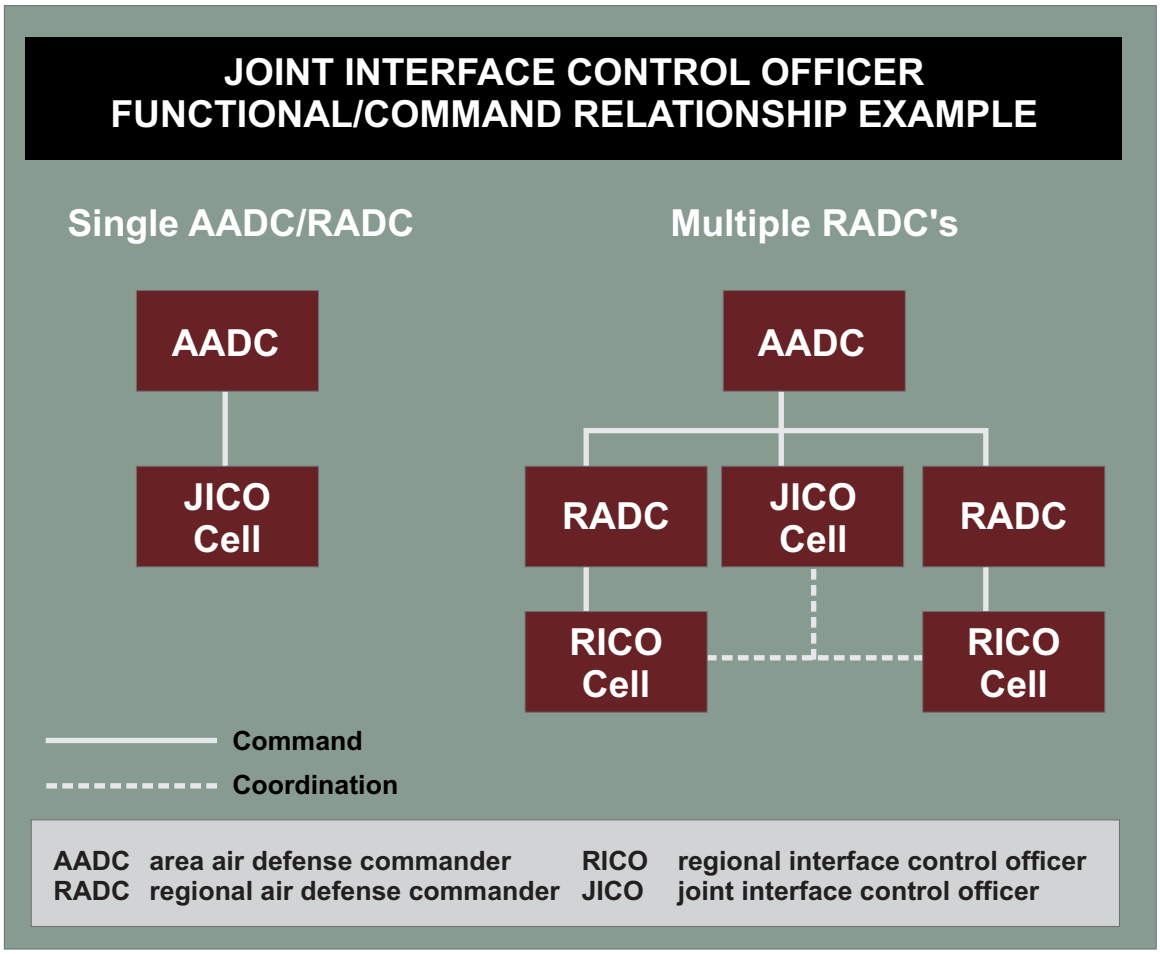

Figure II-2. Joint Interface Control Officer Functional/Command Relationship Example

directly contribute to achieving air superiority objectives. Further, the JFC's situational awareness must be broad to include the relevant actions and intentions of MNF partners, civilian agencies, adjacent commands, higher headquarters, and HN authorities.

b. The JFC uses a COP as a graphic depiction of the situation within the theater/JOA. The COP normally indicates locations of significant friendly, neutral, unknown, and enemy forces. The COP is normally shared with the component commands. The COP is not real time and is at best near real time. The COP is defined as a single identical display of relevant information shared by more than one command. A COP facilitates collaborative counterair planning and assists all echelons to achieve situational awareness. The JFACC normally has the COP at the JAOC.

(1) For counterair situational awareness, a properly managed COP:

(a) Reduces the degree of operational uncertainty.

Reliable command and control capability is required to detect, identify, and track threats to warn and cue defensive assets.

(b) Allows commanders to create and control the battlespace dynamics and not react to them.

(c) Gives commanders more situational awareness of the operational tempo of MNF and US forces.

(d) Reduces decision-making time, thereby dominating the opponent's decision cycle.

(e) Gives commanders the ability to identify, focus and control counterair operations against the enemy's capabilities.

(f) Allows commander to monitor the execution phase of counterair operations and assess how well the operations are progressing in accordance with the plan.

(g) Provides commanders with shared situational battlespace awareness to coordinate joint counterair operations.

(2) An accurate COP requires proper track management that is the responsibility of the geographic CCDR or a designated representative. For a subordinate joint force, track managers are assigned at the headquarters and component commands who are responsible for their reporting and database management. Track information from the components is consolidated in the COP utilizing data link interfaces.

(3) The data link interfaces used for consolidating the track reports to the COP are normally the responsibility of the JICO. The JICO and the JICO cell normally reside at the JAOC to manage all theater/JOA data link interfaces. There may be Service component interface control officers located at the JICO cell and there may be subordinate interface control officers designated at regional/sector air defense commands to manage links for the RADC/SADC who report counterair related tracks up to the JAOC.

c. Additional counterair situational awareness is provided by the theater joint intelligence operations center by processing information/intelligence from surveillance and reconnaissance sensors for display on various mediums, including on the COP.

d. At the tactical level, the CTP is a source of situational awareness. The CTP is an accurate and complete display of relevant tactical data that integrates tactical information from the MTN, composite tracking network, intelligence network, and ground digital network. The CTP enables C2, situational awareness, and CID, as well as supporting the tactical elements of all joint mission areas, to include counterair operations. The CTP supports the COP.

15. Battle Management

a. **Battle management** is defined as the management of activities within the operational environment based on the commands, direction, and guidance given by appropriate authority. C2, including battle management, is the binding element that integrates capabilities and operations within and among joint force commands.

b. Battle management entails visualizing where, when, and with which forces to apply capabilities against specific threats. The dynamics of the counterair mission often requires flexibility during decentralized execution that normally takes place at the tactical level. This flexibility accomplished through battle management allows the direct, often real time monitoring and execution of operations based on the intent and within the scope of the operational-level commander's orders. Some counterair examples: AWACS aircraft, with an air battle manager, may provide battle management of an OCA multistage attack against TSTs using Tomahawk land-attack missiles and aircraft; an AWACS assisting the air-to-air interception of enemy fighter-bombers beyond visual range; or the SADC (at a CRC) using battle management of friendly fighters and SAMs to defend assets in the sector against an air attack by enemy aircraft and CMs.

c. Successful counterair battle management supports synchronization and integration of active and passive air defense efforts with other air operations, supporting unity of effort and reducing the expenditure of resources and the risks of fratricide. For subordinate commanders and controllers, **effective battle management requires situational awareness, managing available resources, directing and controlling the correct action in a timely manner, and monitoring and assessing the execution.**

CHAPTER III
COUNTERAIR PLANNING

"Know the enemy and know yourself, in a hundred battles you will be successful."

Sun Tzu

1. General

a. The JFC develops an operation/campaign plan focused on the enemy centers of gravity (COGs) while ensuring that friendly COGs are protected. Counterair operations strive for the degree of air superiority required by the JFC's COA to attain the desired objectives.

b. Counterair requires a combination of OCA and DCA operations based on the JFC's air apportionment decisions and balanced against the enemy's potential COAs and air and missile threats. The integration and synchronization of OCA and DCA, in conjunction with the other joint missions supporting the JFC, are the bases for counterair planning.

c. This chapter discusses counterair planning in the context of preparation, major considerations, and enabling capabilities that support both OCA and DCA. This discussion assumes a JFACC is responsible for counterair (specifically OCA operations) and an AADC is responsible for DCA operations, whether or not the JFACC is designated as both the AADC and ACA. The joint air operations plan (JAOP) and the AADP, as well as other detailed planning factors, will be discussed in the respective chapters for OCA and DCA.

d. Counterair planning considerations include accurate intelligence preparation of the operational environment (IPOE) and joint IPOE (JIPOE), airspace control, ROE, ID and CID requirements, and some major enabling capabilities.

SECTION A. JOINT INTELLIGENCE PREPARATION OF THE OPERATIONAL ENVIRONMENT

2. General

Knowledge of the potential enemy is one of the fundamentals of joint warfare. The primary purpose of JIPOE is to support the JFC's and component commanders' planning and decision-making needs by identifying, assessing, and estimating the enemy COGs, critical vulnerabilities, capabilities, limitations, intentions, most likely COA, and COA most dangerous to friendly forces and mission accomplishment. To support the decision-making process, the JIPOE effort also must remain dynamic, constantly integrating new information into the initial set of facts and assumptions. JIPOE is a continuous process that enables the JFC and component commanders to visualize the full spectrum of adversary capabilities and potential COAs across all dimensions of the battlespace. JIPOE provides the direction and synchronization of intelligence that supports the COA selection process and the concept of operations (order/fragmentary order) development process. The JIPOE effort must be fully integrated and coordinated with the separate IPOE

efforts of the component commands and Service intelligence centers. JIPOE and IPOE should begin as early as possible during the planning process, preferably during peacetime.

3. Joint Intelligence Preparation of the Operational Environment and Operations Planning

a. JIPOE is described as the continuous, analytical process used by joint intelligence organizations to produce intelligence assessments, estimates, and other intelligence products to support the JFC's decision-making process and all joint force planning. The JIPOE process assists JFCs and their staffs in achieving information superiority by identifying adversary COGs and focusing intelligence collection at the right time and place. JIPOE helps the JFC to react faster and make better decisions than the adversary, or simply stated, to stay inside the enemy's decision loop. JIPOE provides the basis for intelligence direction, collection management, and synchronization that supports not only the COA selected by the JFC, but all joint force planning. The process is used to analyze the operational environment. JIPOE supports counterair planning by identifying adversary air and missile capabilities, and their likely employment. JIPOE products are used by JFC and component staffs in preparing their estimates and analysis, selection of friendly COAs, and continuing planning requirements (e.g., development of a viable concept of operations.

b. JIPOE and IPOE products generally differ in terms of their relative purpose, focus, and level of detail. The focus of JIPOE is on providing predictive intelligence designed to help the JFC discern an adversary's probable intent and most likely COA. IPOE specifically supports the component commands by concentrating on the capabilities and vulnerabilities of the adversary's force components of interest. The process for JIPOE involves four major steps:

(1) Defining the total operational environment.

(2) Describing the effects of the operational environment.

(3) Evaluating the adversary.

(4) Determining and describing adversary potential COAs, particularly the adversary's most likely COA and the COA most dangerous to friendly forces and mission accomplishment. During analysis of the adversary's potential COAs, consideration must be given to the escalation potential when attacking adversary's C2 and other strategic systems.

c. The components' IPOE focuses on the adversary's forces and operations necessary to accomplish the most likely and most dangerous COAs identified by JIPOE. Certain factors of operation planning are particularly important when conducting the IPOE process and failure to properly consider an adversary's most likely and most dangerous COAs can have serious consequences. This is a focal point of OCA/DCA integration, and procedures must be developed to rapidly share data between OCA and DCA forces.

d. IPOE assists the counterair planner in visualizing the battlespace, assessing adversary air and missile capabilities and will and identifying the adversary's probable intent and attack locations. IPOE is not simply enumeration of adversary air and missile systems, but must describe how the adversary air and missile forces operate.

e. JIPOE/IPOE for counterair relates to any information about adversary air and missile threats and supporting infrastructure, including information on enemy air defenses, C2 networks, radar coverage, and other early warning/detection systems, etc. JIPOE/IPOE will provide available information on the following:

(1) Location, status, and disposition of WMD and the capabilities for employing them.

(2) Aircraft operating bases and dispersal sites, to include aircraft carriers and other air capable ships.

(3) Missile target systems, including their infrastructure, storage and operating locations, launch platforms, C2 nodes, missile stocks, forward operating locations/bases (FOLs/FOBs), transload sites, reloading/refueling sites, terrain and road infrastructure (bridges, tunnels) where their destruction could interrupt enemy missile operations and logistics. For example, intelligence will identify BM operating areas where an adversary's TBM C2, infrastructure, and forces may operate.

(4) Order of battle of adversary IADS (i.e., aircraft, SAMs, airfields, and AAA) including C2 systems (i.e., early warning/ground control intercept [GCI] sites and facilities), communication links, and any associated facilities.

(5) Signals intelligence capabilities and EW assets, including operating instructions, vulnerabilities, redundancies, capabilities, and locations.

(6) Changes by adversary in direct and indirect threat emitters, including wartime reserve modes and reprogramming of target sensing weapon systems.

(7) Climate and terrain within the JOA and their effects on friendly and enemy operations.

(8) Overall assessment of the strengths and vulnerabilities of adversary offensive and defensive air systems, including location and status of all key nodes and targets that affect their ability to sustain air operations.

Details regarding the JIPOE process can be found in JP 2-01.3, Joint Intelligence Preparation of the Operational Environment.

SECTION B. AIRSPACE CONTROL CONSIDERATIONS

4. General

a. The primary goal of combat zone airspace control is to enhance combat effectiveness of the joint force. Airspace control should maximize the effectiveness of combat operations without adding undue restrictions and with minimal adverse impact on the capabilities of any Service/functional component. For counterair, all components of the joint force may potentially share a part of the theater/JOA airspace for offensive/defensive operations. This environment becomes increasingly complex with the addition of civilian, nongovernmental and intergovernmental organizations, interagency, HN, and MNF users. Airspace control procedures and planning considerations must allow for a transition from peacetime operations to combat operations, and back to peacetime operations.

b. Airspace control is provided to reduce the risk of friendly fire, enhance air defense operations, and permit greater flexibility of operations. Although airspace control is the responsibility of the ACA, the controlling authority of the ACA does not infringe on the command authorities vested in commanders to approve, disapprove, or deny combat operations. The ACA recommends and the JFC approves the boundaries within which airspace control is exercised and provides priorities and restrictions regarding its use. **Airspace control requires positive and procedural controls**.

(1) Positive control is a method of airspace control that relies on positive ID, tracking, and direction of aircraft within an airspace and is conducted with electronic means by an agency having the authority and responsibility therein.

(2) Procedural control is the method of airspace control that relies on a combination of previously agreed and promulgated orders and procedures.

c. **Airspace Control System.** The ACA establishes an ACS that is responsive to the needs of the JFC and integrates when appropriate the ACS with that of the HN. The ACS is an arrangement of those organizations, personnel, policies, procedures, and facilities required to perform airspace control functions. Airspace control should be executed through a responsive theater/tactical air control system capable of real time control that includes surface and airborne assets, as necessary (e.g., CRC and AWACS). The ACS requires timely exchange of information through reliable, secure, and interoperable communications networks. Elements of the ACS may have dual-roles as DCA assets (e.g., a CRC can be a RADC/SADC).

d. **Airspace Control Plan.** Beginning with an ACP approved by the JFC, the ACA develops broad policies and procedures for airspace control and for the coordination required among units within the theater/JOA. **The ACP establishes the procedures for the ACS in the operational area.** The ACP must consider procedures and interfaces with the international or regional air traffic systems, because the ACP is designed to identify all airspace users, facilitate the engagement of hostile air and missile threats, and expedite the safe passage of friendly and neutral forces.

e. **Airspace Control Orders.** Implementation of the general guidance of the ACP is accomplished through ACOs that provide specific airspace control procedures applicable for defined periods of time. ACOs are designed to deconflict and identify all airspace users as well as eliminate fratricide. **The ACO is an order that provides the details of the approved requests for ACMs**. It is published either as part of the ATO or as a separate document and must be adhered to by all components. It defines and establishes airspace for military operations deemed necessary by the appropriate military authority. It notifies all agencies of the effective time of activation and the composite structure of the airspace to be used. The ACO may include ACMs and fire support coordination measures (FSCMs) such as air routes, base defense zones, coordinating measures/lines, drop zones, pickup points, restricted areas, etc. A change to the ACO should be distributed whenever a new area is established or an existing area deleted.

f. **Airspace Coordinating Measures.** ACMs are designed to facilitate the efficient use of airspace to accomplish missions and simultaneously provide safeguards for friendly forces. ACMs may take several forms and will be discussed in paragraph 6.

g. **Integration of the ACP with the AADP.** The ACP facilitates synchronization and deconfliction of joint operations. Prioritization of airspace users for deconfliction/synchronization is essential. The ACP must be integrated with the AADP because airspace control areas/sectors normally coincide with air defense areas/sectors and there are DCA operations and procedures that could interfere with normal airspace control procedures. **Both plans should complement available C2 systems and capabilities.** JFC-approved ACMs help integrate the two plans.

Airspace control integrates different airspace users and provides them with responsive and timely support.

Airspace control must be flexible enough to meet rapid changes such as the real time retasking of OCA forces against TSTs.

5. Planning and Coordination Requirements

a. **Planning for Airspace Control in the Combat Zone. Every JTF is different and each operational area has specific operational requirements for airspace.** These requirements must be determined as early as possible and incorporated in the overall joint force planning effort. Political constraints and national and military airspace management systems and procedures and their capabilities and limitations are important considerations. ROE, disposition of air defense weapons, fire support plans, and procedures for ID of US and MNF aircraft are also important items to consider. **The following broad principles of planning** (see Figure III-1) **are essential for effective airspace control:**

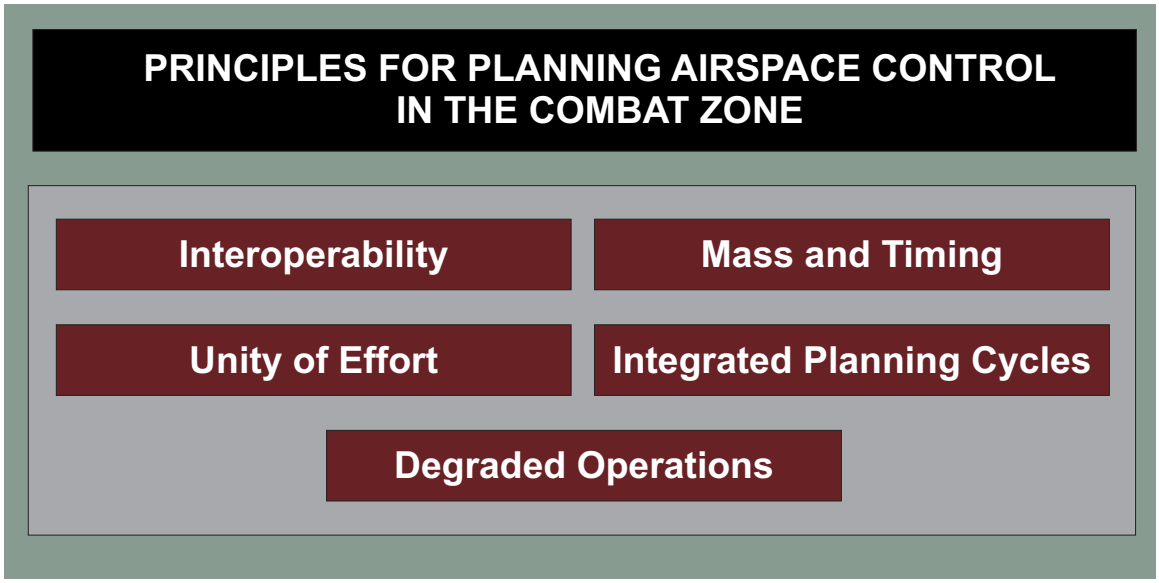

Figure III-1. Principles for Planning Airspace Control in the Combat Zone

(1) **Interoperability.** Plans for airspace control should be exercised in the joint and multinational environments during peacetime and in conflict. Planning should strive to maximize the interoperability of equipment, personnel, and terminology and facilitate continuous, detailed coordination where interoperability is not possible. **The ACS must function with the AMD system and may include dual tasking of certain radar, sensor, and C2 assets**. Interoperability is essential to effective operations, conservation of force, and to prevent fratricide.

(2) **Mass and Timing.** Planning should consider the aircraft traffic volume and timing to fully integrate DCA with OCA and other joint missions. Constraints may require changes in positive or procedural control measures.

(3) **Unity of Effort.** The ACS must be integrated and coordinated with the AMD system, including dual-tasking of assets as necessary. Integration of a HN air defense system (as part of an IADS) and air traffic control (ATC) system should be properly planned. Proper

liaison is essential and should be identified and exercised prior to hostilities when integrating HN and joint force airspace control.

(4) **Integrated Planning Cycles.** The airspace control planning cycle must be integrated with the joint operation/campaign planning cycle, and more specifically, the AADP planning cycle. The ACP normally is added as an appendix to the operations annex of the joint OPLAN or operation order.

(5) **Degraded Operations.** The ACP must anticipate degraded operations of airspace control and air defense systems as the results of attacks (combat losses) and enemy EW efforts. Loss of communications can dramatically degrade positive control measures. Effective plans should span the spectrum from minimal to full degradation and consider the effects of adverse weather and night operations.

Refer to JP 3-52, Joint Doctrine for Airspace Control in the Combat Zone*, for detailed information regarding airspace control, the ACP, and the ACO.*

b. Military ATC facilities and radar control units (e.g., Marine TAOC, or Air Force CRC) normally will provide flight following and monitoring throughout the airspace control area. If a HN ATC system is used before hostilities, then procedures must be in place to revert to the military system when required. The urgent exchange of information between the ATC facilities, radar control units, and airspace users requires reliable voice and data nets; radars; identification, friend or foe (IFF); and selective ID features. **Accurate and timely ID enhances engagement of enemy aircraft and missiles, conserves friendly resources, and reduces risk to friendly forces.**

c. Key factors to consider when developing the ACP are as follows:

(1) The ACP should be coordinated with the HN if it includes its airspace or its systems.

(2) When developing the ACP, combine familiarity with the basic OPLAN or operation order, knowledge of host and multinational constraints and restraints, capabilities and procedures of HN civil and military airspace management systems, and general locations of friendly and enemy forces.

(3) The ACP needs to support an orderly transition between peacetime and combat operations. Such a transition could occur during a period of increasing tensions or suddenly without warning.

(4) The ACP specifies ACMs to be used in the operational area and how these measures will be distributed and implemented. The ACP should provide guidance on what FSCMs will be placed on the ACO. The ACP also should provide guidance on component-unique ACMs, terms, or graphics that may be included in the ACO.

(5) The ACP provides procedures to fully integrate the resources of military ATC facilities responsible for terminal-area airspace control or en route ATC. ATC facilities should be interfaced and linked with ACS communications to form a system that ensures the safe and efficient flow of air traffic.

(6) The ACP shall include processes for establishing procedural ACMs, including activating/deactivating weapon engagement zones and minimum-risk routes (MRRs), and procedures for air defense and air control operations in a degraded communications environment. Detailed engagement procedures and decentralized weapons control procedures (as applied to air defense) are key to counterair operations in a degraded environment. The geographic placement of weapons, the location of specific air defense operations, and specific procedures for ID of aircraft and missiles are critical factors to include in the ACP.

(7) The ACP and AADP must be distributed to all joint force components, applicable HN and MNF agencies, as well as those commands providing direct delivery (intertheater) and/or intratheater support to the theater/JOA. **Not understanding or following the ACP and AADP may result in hazardous air traffic situations, cause confusion between aircraft and control agencies, and increase the risk of fratricide.**

d. Some specific counterair requirements that must be accounted for in the ACP or through ACMs include:

(1) General orbit locations for DCA combat air patrols (CAPs), airborne warning and control, C2, surveillance, reconnaissance, air refueling (AR), and EW platforms.

(2) Coordinating authorities for controlled airspace and their responsibilities and coverage areas, including the RADCs/SADCs and other C2 nodes.

(3) Weapons engagement zones (WEZs) and their activation procedures.

(4) Procedures for positive and procedural airspace controls.

(5) Positive ID and procedural ID criteria and procedures.

(6) Procedures to expeditiously route outbound OCA packages through friendly airspace. This will become more complex in a multinational environment.

(7) Develop airspace control procedures for OCA missions including the communications conduits (e.g., airborne C2 or satellite communications) for missions that may occur beyond the visual/communications range of ground-based C2 agencies.

(8) Locations and procedures for MRRs, for turning on/off IFF equipment, air defense ID, and areas for sanitizing returning OCA packages from enemy aircraft.

(9) Procedures to support planned responses for air defense emergencies.

(10) Procedures to support immediate attacks on TSTs by aircraft or long-range surface fires such as SSMs, rockets, and CMs.

(11) Identify airspace control tasks for airborne elements of the TACS (e.g., AWACS). The sensor capability of airborne platforms makes them well suited for providing airspace control for real time execution of OCA and DCA operations.

(12) Procedures to recover aircraft unable to self-identify and UASs recovering autonomously.

(13) Identify potential ACMs that allow aircraft and surface fires to simultaneously engage ground targets in support of the land forces — the aircraft being above the airspace required for supporting surface fires.

6. Airspace Coordinating Measures

a. ACMs are employed to facilitate the efficient use of airspace to accomplish missions and simultaneously provide safeguards for friendly forces. Airspace control requires a combination of positive and procedural controls that rely on proper ID of the users. ID is discussed in Section D. Positive control requires radar or other sensor tracking and direct communications between the airspace controller and the user. Procedural controls are established through ACMs.

b. ACMs not established in the ACP are normally forwarded through a component command's senior airspace control element to the ACA for processing and approval. Approved ACMs are normally promulgated through ACOs and, when necessary, in the ATO. Some ACMs are planned, requested, and approved, but not promulgated or activated until required.

c. **For standardization, more than a hundred ACMs have been categorized and defined/described with applicable uses and planning considerations.** Those ACMs have been grouped in the following categories: air defense areas, air defense operations areas, ATC, air corridors/routes, procedural controls, reference points, restricted operations zones, and special use airspace.

d. A good example of the use of ACMs for integrating procedural airspace control with DCA operations is the WEZ. In air defense, a WEZ is airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with a particular weapons system. WEZs include fighter engagement zone (FEZ), high-altitude missile engagement zone (HIMEZ), low-altitude missile engagement zone (LOMEZ), and short-range air defense engagement zone (SHORADEZ), each of which is established by an ACM. WEZs are discussed in more detail in Chapter V, "Defensive Counterair Planning and Operations."

Refer to JP 3-52, Joint Doctrine for Airspace Control in the Combat Zone*, for more details regarding ACMs, including a representative airspace control request format for a procedural ACM, and for the list of the most common ACMs.*

7. Other Considerations

a. Maritime strike groups are not static; they are usually a "moving joint engagement zone (JEZ)." In a littoral environment, an amphibious operations area may encompass a sector of a land AO and include a MEZ. In this case, maritime combatants may be restricted by geography when defending selected coastal assets. **Linking land-based SAM systems with search and fire control data from maritime forces, or vice versa, can result in improved ability to defend littoral areas of the theater.** Without that kind of close coordination between land and maritime air defenders, a seam may be found in the AMDs.

b. Operations along the edges of WEZs, sectors, or other geographically defined areas of airspace with separate controlling units/commands may create seams and present commanders with extensive coordination challenges. Enemy aircraft may cross into adjacent sectors during engagement or may fly through friendly corridors or attack targets in one sector or WEZ from an adjacent area. The following are some considerations that may facilitate coordination:

(1) Establish procedures to coordinate handoffs of flight operations between sectors and regions that grant permissions to enter and depart airspace and coordinate combat zone control activities with HN ATC services. A dedicated communications network/line for the regions/sectors is a must if real time handoffs are required.

(2) Liaison officers should be located at ATC centers that provide positive control for areas overlapping or adjacent to air defense areas.

(3) Designate buffer zones in which one DCA region/sector can authorize engagement in an adjacent area.

(4) Whenever possible, establish friendly air corridors outside the ranges of friendly air defense forces that rely only on visual ID to reduce the risk of fratricide, since visually aimed surface weapons often have no capability to readily identify airspace boundaries or control measures in their portion of the operational environment. The ACA and AADC must collectively plan to address the issue.

c. During forcible entry operations or in undeveloped theaters C2 should be simple and facilitate the joint force's ability to respond to a given threat. **The ACP must be continuously assessed through feedback from commanders to ensure it adequately supports operational requirements in a potentially dynamic operational environment.** The initial architectures may need to be modified based on the situation and/or additional assets arriving into the operational area.

SECTION C. RULES OF ENGAGEMENT

8. General

ROE are directives issued by a competent military authority that delineate the circumstances and limitations under which US forces will initiate and/or continue combat engagement with other forces encountered. ROE, as approved by the President/Secretary of Defense, are found in Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3121.01B, *Standing Rules of Engagement/Standing Rules for the Use of Force for US Forces.*

a. With SecDef approval, CCDRs may augment the standing rules of engagement (SROE)/ standing rules for the use of force (SRUF) with theater-specific ROE and with supplemental instructions. The JFC and commanders at every echelon are responsible for establishing/ implementing ROE, but their ROE cannot be less restrictive than that approved for a superior commander.

b. The JFC implements the approved SROE/SRUF/theater ROE and may request more specific ROE for the JOA/mission. **The key is to anticipate the requirement so the changes may be staffed and approved at the appropriate level for implementation when needed at a specific time or for a special circumstance.** The JFC normally requests inputs from subordinate commanders when developing the ROE. To prevent violations or misunderstandings, ROE should be simple and easy to understand with little room for interpretation. **ROE must be not only promulgated to the joint force, but members must also be trained on the ROE.** When planning counterair operations, the component commanders must ensure they comply with the established ROE for the theater/JOA that may include special (and somewhat different) ROE for separate operations. ROE can limit or restrict certain options, targets, and methods. For example, the air ROE may restrict firing of air-to-air weapons in self-defense if the target is beyond visual range or across an international boundary. ROE is promulgated through command channels by numerous means, and normally can be found in the special instructions (SPINS) section of the ATO. The JFACC/AADC should offer ROE recommendations to the JFC in anticipation of the need, or when requested to do so. In conjunction with ROE recommendations, engagement authority and its delegation and other authorities must be considered and may be part of the ROE. MNF operations may further complicate processes for establishing and executing ROE.

c. For MNF operations, nations may have specific ROE that cannot be changed or overruled by alliance or coalition chains of command. These national procedures must be identified, published, and understood by all other nations and command echelons within the MNF.

9. Criteria

a. **Obligation and Responsibility for Defense.** Unit commanders always retain the inherent right and obligation to exercise unit self-defense in response to a hostile act or a demonstrated hostile intent. Self-defense includes defense of other US military forces in the vicinity. The commanders of all US forces must ensure that the ROE as established do not place constraints

on a unit's ability to defend itself. Two elements that ensure adequate flexibility in ROE are **hostility criteria** and **scale of force**, and they apply to ROE in all operations.

(1) Hostility criteria provide the commander with guidelines to judge whether a potential attacker exhibits hostile intent, clarifying whether an engagement is appropriate and/or is authorized.

(2) The principle of proportionality requires that the use of force be in all circumstances limited in intensity, duration, and scope to that which is reasonably required to counter the attack or threat of attack and to ensure the continued safety of US forces. Graduated escalation of force usually is appropriate in ambiguous situations before resorting to deadly force. **A graduated set of criteria is intended to provide a selection of responses from which to choose**; it is not a checklist to take offensive actions. Commanders must ensure that subordinates do not feel constrained to progress sequentially through the graduated responses, nor should they automatically be inclined to continuously escalate severity of the responses based on subsequent or additional hostile provocations. The principle of proportionality applies to all stages of conflict.

b. **Functional Rules.** Commanders should also develop functional rules as to how ROE are to be tactically implemented. Some examples are **arming orders**, which specify circumstances under which commanders will permit loading or arming of munitions and **border crossing authority (BCA)**. Prior to a formal declaration, adversary national borders are sovereign and cannot be violated without specific authorization. Permission to violate borders may be pre-delegated to the JFC after hostilities or under specific conditions or restrictions to enable force protection. BCA also applies to aerial reconnaissance. Space platforms are not restricted as the United States adheres to a policy of freedom of navigation in space based on treaty and customary international law.

c. **Integration with the ACP and AADP.** The ROE are an integral part of the AADP and the ACP. Commanders and their staffs must ensure that the AADP contains specific instructions that implement the ROE. It is an important point to ensure the ACP, AADP, and the ROE are consistent with regard to aircraft in international air corridors. These corridors are usable by civilian aircraft, even those operated by an adversary, until the international governing body or an appropriate authority closes a route and a notice to airmen is issued. Commanders must ensure the proper response is made when penetrations of the friendly airspace occur under the auspices of international air flight.

10. Planning

a. Normally, the initial ROE are already established by higher authority or an existing plan. The JFC is responsible for establishing and implementing the ROE and anticipating changes to ROE based on operational necessity such as changing phases of an operation. The ROE are an integral part of the operations planning process and the J-3 is responsible for its integration for the JFC. Centrally planned ROE, ID, and engagement procedures are vital for minimizing duplication of effort and the potential for fratricide while providing necessary flexibility to engage.

b. Some permissive ROE may be necessary. For example, permissive ROE may allow use of beyond visual range weapons to engage hostile targets as early as possible. Another example of permissive ROE would entail instructions directing decentralized execution by the joint force to immediately engage any incoming TBMs. However, that same ROE may restrict retaliatory or preemptive attacks against the launcher that may result in its destruction but permit the use of nonlethal capabilities that disable or neutralize the launch system. JFCs may elect to include any category of CM or antiship missiles for accelerated engagement as the situation warrants.

c. When developing their ROE recommendations, commanders and staffs must coordinate with their staff judge advocates (SJAs) for compliance with US and customary international law. Once the ROE are approved, commanders, assisted by their SJAs, are responsible for promulgating the ROE and ensuring that all subordinate forces understand the ROE. Commanders must also maintain close coordination with the public affairs office to ensure their awareness of any IO considerations.

d. Lower echelon MNFCs and local HN commanders may lack the authority to speak on behalf of their nations in the ROE development process. Complete consensus or standardization of ROE should be sought, but obtaining concurrence for ROE from other national authorities is a time consuming process. MNF ROE should be kept simple so that national policies can be more readily adapted.

e. US forces participating in MNF operations will follow the ROE established by the MNFC if authorized by the Secretary of Defense. US forces will be under the control of a MNFC only if the Secretary of Defense determines that the ROE for that MNF are consistent with the policy guidance on unit self-defense and with the rules of individual self-defense contained in the SROE/SRUF. If the MNFC has not issued ROE, US forces will operate under the SROE/SRUF.

SECTION D. IDENTIFICATION

11. General

a. ID is the process of determining the friendly or hostile character of an unknown detected contact. The ID of a track is the product of that process. Assigning ID requires ID authority and criteria. ID authority is the authority to assign an identity of friendly, hostile, or neutral to an unknown contact, if possible. This authority is inherent within the C2 chain, normally beginning with JFC approval and delegation to the AADC and can and should be delegated to subordinate commanders for decentralized execution as allowed by the JFC through the ROE and necessitated by the operational situation. ID authority and ID criteria should be stated and discussed in the AADP and ACP for approval by the JFC. **Both ID authority and criteria may require modification, sometimes in conjunction with ROE, in a dynamic operational environment and/or with changes in phases of the campaign.**

b. ID is an essential and inseparable part of airspace control and air defense operations. Reliable and accurate sensors (e.g., radar) with accurate and timely ID enhances situational

awareness, improves weapons employment options, helps conserve friendly resources, and reduces the risk of fratricide.

c. The CID process complements the ID process to support application of weapons resources and other military options. For counterair, CID should be accomplished with near real time or better exchange of information between airspace control/air defense units and airspace users to meet the time and accuracy demands of combat operations. CID is discussed separately in paragraph 14.

12. Methods of Identification

a. For the purposes of counterair, the intent of an ID process is to either facilitate airspace control or to support an engagement decision through CID. The objective of CID is to obtain the highest confidence, positive ID possible. Lacking positive ID, the objective is to reach the level of confidence in an ID that can be supported by the ROE for an engagement authority to make a decision. ID can be accomplished through several recognized methods. The JFC approves the procedures used for ID and designates who may be delegated that authority in the AADP and ACP.

b. **Positive ID.** Positive ID is an ID derived from visual observation and/or electronic systems, possibly combined with other factors. Positive ID normally is required by ROE as a basis for CID for engagement (shoot/no-shoot) decisions, so it also is useable for ID for airspace control and air defense tracking. Normally, a positive ID means much more than a simple "lack of friend" or "lack of enemy" level of accuracy. The degree of accuracy of a positive ID method is specific to that method and should remain a constant, whereas CID criteria can be changed by the JFC based on ROE. Positive ID ACMs should be established in the AADP and ACP and can be modified through ACMs promulgated by ACOs and the SPINS.

c. **Procedural ID.** Procedural ID is ID based on procedural methods previously agreed upon as ACMs and promulgated through the ACP, ACOs, and SPINS. Procedural ID separates airspace users by geography, altitude, heading, time, and/or maneuver. Normally, a combination of positive and procedural ID is used to identify friendly and hostile tracks. Procedural ID can be advantageous for some missions and scenarios, but generally not for engagement decisions for which positive ID is normally required because of the risk of fratricide. **The AADP should include a matrix with criteria developed by the AADC in coordination with the components and approved by the JFC that can be used to establish a track ID for a detected object**. The ID matrix is a tool for categorizing a track (e.g., friendly, hostile, unknown or neutral) and following it throughout its life in the AOR/JOA. The ID matrix applies logical steps to ID a track using all available means in the operational area. By following the criteria in the matrix, users assess the identity of an unknown for tracking and additional action, if necessary. If not identified as friendly, an object being tracked may require further assessment based on position, the ROE, and weapons control status (WCS). WCS will be discussed in Chapter V, "Defensive Counterair Planning and Operations," paragraph 11.

d. **Auto-ID Systems.** Some weapon systems have the capability to execute an auto-ID function (e.g., aircraft carrier auto-ID, Aegis-equipped ships, and PATRIOT missile systems). Use of auto-ID can reduce the work load (no man in the loop) and improve the timeliness of the ID process in an extremely dynamic/saturated air defense environment, but it also can result in mistaken ID and fratricide, engagement of noncombatants, or inadvertent protection for the enemy. The CID and ROE criteria for engagement should explicitly discuss when auto-ID is allowed. Automation should not replace the judgment of operators in a tactical situation, and should be used only to keep the operators from being so overwhelmed they become ineffective and cannot make enough knowledgeable decisions.

e. **Formation assessment** is a procedural ID method used to apply the ID (from positive or procedural means) of one air track to other aircraft operating in mutual support as determined by their spatial relationship. That spatial relationship (horizontal range, altitude separation, speed, and course), which can be called formation criteria, must be determined by the AADC and ACA, approved by the JFC, and published in the AADP and ACP. Formation criteria may vary by theater/JOA. See Figure III-2 for a depiction of that spatial relationship. This formation criteria is a procedural ACM to help manage the volume of tracks (and operator workload) that must be displayed on the joint TDL and elsewhere (e.g., COP). Formation strength information may be handled in various ways by those surveillance elements of the IADS that contribute to the MTN. To declutter the air tracking displays of surveillance systems, a single track is carried with the number of objects meeting the formation criteria entered as a number on the track information associated with the ID symbol. Referred to by various systems as strength/flight size/raid numbers/composition, the process is described as formation tracking. The purpose of formation assessment is to provide timely and accurate track ID to engagement platforms (airborne or surface-based air defense assets) to support engagement decisions for hostiles yet minimize the chances of fratricide. The use of formation assessment presumes that a formation track has been established and that an ID has been placed upon the formation track by competent ID authority. Also, the same formation assessment criteria must be applied to the other local tracks (non-TDL tracks) as was used by the surveillance system used to create the formation track to ensure integrity of the process. Failure to use the same specified criteria for formation tracking and formation assessment may mistakenly result in the application of "friend protection" to hostile aircraft or engagement of friendly aircraft by friendly weapons platforms. The risk of friendly engagements and friendly protection to hostile aircraft is greater with formation assessment in effect, but to help mitigate this risk, care should be taken in the development of the spatial criteria used for the formation assessment.

f. **Formation Tracking.** Formation tracking is the use of a single datalink air track (with a strength field indicating the number or estimated number of aerial vehicles comprising the formation) to represent a formation of two or more aerial vehicles. To qualify for formation tracking, the aircraft in the formation must maintain a theater-specified (though variable) spatial relationship with each other (e.g., horizontal range, altitude separation, speed and course differentials). Air surveillance systems selectively employ formation tracking when displaying air tracks. Formation tracks are displayed to the operators and transmitted to other air surveillance and air defense systems via joint TDL. Formation tracking reduces operator workload, allows

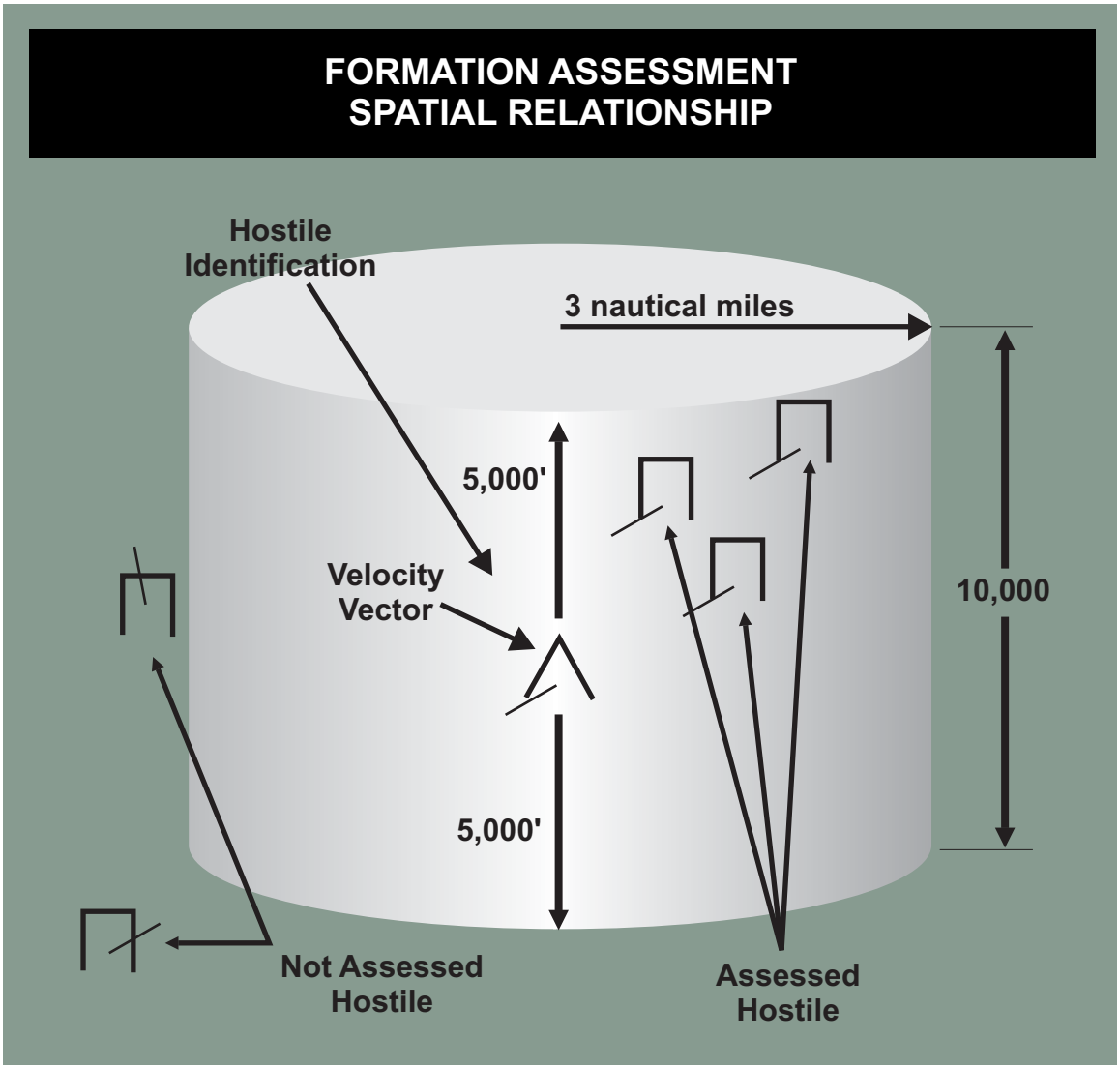

Figure III-2. Formation Assessment Spatial Relationship

older C2 systems to handle larger surveillance responsibilities and reduces the number of transmitted tracks required to represent the entire air picture.

13. Identification, Commitment, and Engagement Authorities

a. The AADC has certain authorities, delegated by the JFC, that must be understood and may be delegated to subordinate commanders such as a RADC/SADC. The authorities of identification, commitment, and engagement are required for decisions based on established criteria that may be tied to operational capability and are rooted in the ROE. Delegation of those authorities is a means of decentralizing the execution of DCA operations. In joint and MNF operations, subtle differences may exist in the processes and terminology used to authorize the employment of weapons. It is imperative that the command lines, engagement authorities, engagement procedures, ROE, and terminology be standardized, documented, clearly understood, and rehearsed (if possible) before an engagement decision is necessary.

b. **Identification Authority.** The AADC will establish the policy for ID authority, with JFC approval, and will promulgate it via the AADP, SPINS, and/or an operations task link (OPTASKLINK) supplement. Execution of the ID policy normally is delegated to the tactical level, but care must be taken that the tactical commander is capable of performing the ID function in real time. There are seven track classification symbols, but due to varying host-system implementations of Military Standard 6016A, *Tactical Digital Information Link (TADIL) J Message Standard*, only three can be used across the IADS to produce a common and unambiguous (unique) track display: friend, hostile, and unknown. The next closest unique symbol is "neutral," but there are inconsistencies in how "neutral" is interpreted and displayed by some Service component systems. Some systems implement variations in symbols such that use of "pending," "suspect," and "assumed friend" carry a significant risk of system-to-system variance and will produce an uncommon MTN picture. Proper and consistent execution of the ID policy is extremely important to minimize fratricide and prevent misidentified friendly/neutral tracks from successfully penetrating the defenses for an attack.

(1) The criteria for track classifications and the meanings of those classifications are approved by the JFC as part of the AADP, and any changes, especially those regarding ROE (e.g., meaning of hostile and engagement criteria) would be promulgated on the current SPINS and through ROE serial changes. **An ID of hostile, subsequently placed on the TDL with a hostile symbol, normally does not necessarily constitute authority to engage (employ weapons).** Based on the ROE, **a positive engagement order normally is the required authority**, such as a voice or specific electronic direction to "engage." An ID of hostile may be assigned a track based on procedural ID, but the engagement decision normally is based on positive ID or affirming hostile intent or a hostile act. **To avoid fratricide and potential TDL ambiguities, any uncertainty as to what specifically constitutes engagement authority must be resolved within tactical timelines before allowing weapons employment (engagement).**

(2) In addition to employing ID authority, proper application of ROE must be made in conjunction with WCS (free, tight, or hold/safe). Once identified, a track is followed until no longer of significance (friendly or neutral) or required to be engaged (confirmed hostile by CID or hostile intent), but tracks do not have to be hostile to continue to be tracked. It is not uncommon for a procedural ID of a track to be changed, based on better information, such as a later positive ID or a change in the determined intent.

c. **Commit Authority.** Commit authority may be used (and delegated) by the AADC as a battle management tool. Commit authority describes the air defense echelon that may dedicate an asset to **prepare to engage** an entity (e.g., position a DCA fighter to intercept or direct an ADA unit to track and target). **Commit authority does not imply engagement authority.** Further permission is required to engage an entity that has been committed upon. If the unit with commit authority also holds engagement authority, the engagement decision is still separate and unique. Commit and engagement authorities are typically split during the transition phase of a major campaign or during containment and show of force operations to avoid accidental escalation of conflict. For example, during a deter/engage phase, the JFC may approve delegation of commit authority down to the tactical level (e.g., RADC/SADC) but retain engagement authority with the AADC or the JFC to prevent inadvertent escalation by a lower level command.

d. **Engagement Authority.** The JFC is vested with authority to prosecute engagements within the theater/JOA consistent with ROE currently in effect. For air defense engagements within the IADS, the authority normally is delegated to the AADC who may further delegate the engagement authority to tactical levels (e.g., RADC/SADC). The degree of delegation must be consistent with the ROE, the DAL, and the inherent right of self-defense. In addition to engagement authority, the process and means of ordering engagements (shoot/no-shoot) must be clearly stated in the AADP or ACO and SPINS. For example, a TDL track identified and carried as hostile (by symbol) and perhaps passed from one sector to another remains hostile unless there is a loss of tracking, and normally cannot be engaged without further assessment (CID or known hostile act or intent) and a real time engagement order by the controlling air defense command with engagement authority.

14. Combat Identification

a. **CID is the process of attaining an accurate characterization of detected objects in the operational environment sufficient to support an engagement decision.** Ideally, the CID process uses the most positive ID methods available to allow the highest confidence required for that decision, because it normally is one of the most critical decisions to be made. Some commanders use the CID process as the basis for high confidence, timely application of other military options, and not just for the employment of weapons.

b. The CID process is determined by the JFC (normally in coordination with subordinate commanders), supported by the ROE, and may be situational dependent and/or time-sensitive. CID allows the commander to balance the level of confidence in the ID method against the risk associated with an erroneous ID. While high confidence-low risk is always desired, the commander may face situations when the absence of positive ID requires procedural ID be used with a recognized increase in the risk of fratricide or to mis-ID an enemy (i.e., low confidence-high risk). This remains a commander's decision. For example, during DCA operations against numerous simultaneous attacks by enemy aircraft and CMs, potentially with WMD, it may be necessary to accept lower confidence ID methods for hostiles and increased risk of fratricide to minimize the risk of a "leaker" getting through to the target. Unambiguous lines of command and clarity of ROE are particularly important to the CID process, especially when delegating authority for engagement decisions during decentralized execution.

c. **The CID process is for all joint forces, and for defensive action as well as offensive.** For example, CID may provide a positive ID of friendly SOF positioned in close proximity to a high priority target system deep in enemy territory being attacked from the air. The leader/battle manager of the attacking force would use that CID when making an engagement decision on that target.

d. A CID matrix is a good tool for the CID process for counterair. To that end, the CID matrix should mirror the ID criteria and the CID process contained in the counterair plans and must be coordinated to ensure no conflicts arise during joint operations.

See Appendix A, "Combat Identification," for additional discussion of CID and a sample ID process matrix.

15. Multinational Considerations

a. Special attention must be paid to establishing a workable CID system during MNF operations. A mix of units with dissimilar capabilities and differing electronic systems, fire control doctrine, and training can present the AADC with an extremely difficult air defense situation. Advanced planning may be required to compensate for a "patch work" of separate MNF CID capabilities, not just for the surface air defense and air control units, but for their aircraft as well.

b. No matter how integrated a CID system is established, as much training as possible should be conducted to facilitate the CID processes. Means of positive ID should be stressed as early in the planning phases as possible, and every effort made to devise a system of positive ID for each MNF members' aircraft when airborne.

c. In addition to the ID/CID obstacles, the AADC must ensure the promulgation of that data throughout the MNF. While US joint forces may have TDL, many MNF may not have the same TDL interoperability.

SECTION E. ASSET PROTECTION

16. General

a. The JFC and staff will normally develop a prioritized critical asset list (CAL) (see Figure III-3) with inputs from the components and based on the theater level protection required to support tasks/missions assigned by the JFC. The CAL should include designated assets within the joint security areas

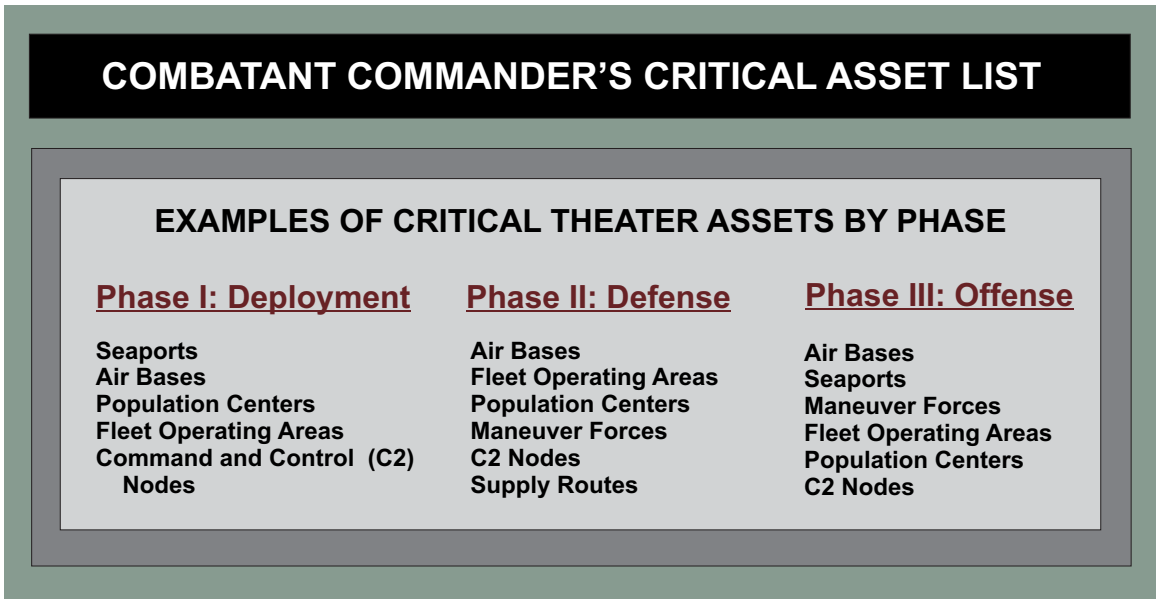

Figure III-3. Combatant Commander's Critical Asset List

(JSAs) of the JOA. Protection for JSAs outside the JOA, but within the AOR, normally remains the responsibility of the supported CCDR. Protection of the lines of communication outside the AOR and vulnerable to enemy (or their ally's) air and missile attack must be coordinated with the responsible CCDR by the supported CCDR. For DCA protection, the joint security coordinator designated by the JFC normally coordinates with the AADC to ensure the JSAs are appropriately covered by the AADP. Usually the number of assets requiring some level of AMD will be greater than the resources available to defend them. Also, due to the dynamics of joint operations, priorities may change over the course of the operation or campaign.

b. The completed CAL is forwarded to AADC who will allocate available active air and missile defense forces to defend the prioritized assets listed. The product of this effort is the DAL. The DAL is a list of those assets on the CAL that receive theater level asset protection. Each defended asset on the DAL should be prioritized as requiring active air defense or appropriate passive measures if that is all that is available. After initial active defense allocation, commanders should consider "clustering" to conserve air and missile defense forces and assess if passive measures alone satisfy an assets' required defensive posture. If passive measures alone are insufficient to defend an asset on the DAL, the issue should be resolved by the JFC. Once completed, the DAL is approved by the JFC.

17. Critical Asset List Development

a. All assets nominated for the CAL usually are prioritized based on a methodology of assessing the three major factors of criticality, vulnerability (includes recoverability), and the threat (CVT). This is called the "CVT methodology." The CVT process is objective and considers intelligence, air operations, ground combat operations, maritime operations, and support operations. Each asset is evaluated against defined criteria, and these criteria are weighed based on the consideration of the JFC's intent, concept of operations, and COG concerns.

b. **CAL Development Factors**

(1) **Criticality** is the degree to which an asset is essential to accomplishing the mission. It is determined by assessing the impact that damage to or destruction of the asset will have on the success of the operation/campaign. Damage to an asset may **prevent, significantly delay**, or **have no impact** on success of the plan.

(2) **Vulnerability** consists of two parts: **susceptibility** (the degree an asset is susceptible to surveillance, attack, or damage), and **recoverability**, if attacked and damaged. Recoverability, once a factor itself, is now a subset of vulnerability and is the degree and ability to recover/reconstitute from inflicted damage in terms of time, equipment, and manpower and to continue the mission. Commanders should consider the time to replace personnel, equipment, or entire units, as well as whether other forces can perform the same mission. The following factors should be considered when assessing vulnerability:

(a) Survivability and cover (hardening).

(b) Camouflage and concealment.

(c) Mobility and dispersion.

(d) Ability to adequately defend itself from air/missile threats.

(3) **Threat.** Assess the probability an asset will be targeted for surveillance or attack by a credible/capable adversary. A thorough JIPOE oriented specifically on adversary air and missile capabilities is key to an accurate threat assessment. Examples include targeting information provided by intelligence estimates, past adversary surveillance and attack methods, and threat doctrine.

c. **High Value Assets.** High value assets are classified as friendly critical assets requiring protection. They may be any asset (i.e., forces, facilities) the friendly commander requires for the successful completion of the mission. They are categorized as follows:

(1) **High Value Geopolitical Assets.** Those assets so important that the loss of even one could seriously impact the JFC's operation/campaign. In addition, the political ramifications of destroying one of these assets could provide the adversary with a tremendous propaganda victory.

(2) **HVAA**

(a) Include all major airborne platforms for C2, reconnaissance and surveillance, targeting, aerial refueling, and EW (e.g., AWACS, Rivet Joint, JSTARS, Compass Call, Cobra Ball, Global Hawk, and U-2). Depending on the defensive situation, other special mission aircraft also may be considered.

(b) Active protection for HVAA normally is performed by fighter escorts, a fighter CAP between the HVAA and all potential air-to-air threats, or surface-based AD systems between the HVAA and the enemy.

(c) Passive protection includes positioning HVAA stations or orbits beyond enemy interceptor or SAM range.

(3) **High Value Units**

(a) Maritime assets including aircraft carriers, maritime pre-positioning ships, combat logistics force ships, and amphibious ships conducting amphibious assaults and landings.

(b) Active protection normally is provided by maritime AAW capable systems (e.g., fleet air defense assets).

(c) Passive protection is accomplished by operating outside of the range of the enemy's weapons envelope.

(d) Land assets include air and surface ports of debarkation, major supply route checkpoints, early entry forces, operations centers, and logistical centers.

(e) Active protection normally is provided by organic ADA systems.

(f) Passive protection is accomplished by cover and concealment, dispersal and operating outside the envelope of the enemy's weapons capabilities.

18. Defended Asset List Development

a. **DAL Development Considerations.** The DAL is a product from the process of applying the CVT methodology, AMD resources, and defense design to the CAL while identifying the risk. It identifies the prioritized assets from the CAL to be actually defended with resources available. For prioritizing the DAL, the following are those considerations for levels of protection and levels of engagement effectiveness.

(1) **Levels of Protection.** A level of protection is an aggregated probability that an asset will not suffer mission critical damage from an air or missile attack. It encompasses all joint force capabilities used to defeat the air and missile threat. Levels of protection are assigned to each entry on the CAL list based upon the outcome of the CVT analysis.

(a) **Level 1.** Level 1 provides the highest level of protection to assigned assets. It is a primary driver for resource positioning, planned methods of fire/integration of fires and initialization of DCA systems to obtain the highest feasible probability of protection against specific threats.

(b) **Level 2.** Level 2 provides the highest protection achievable while maintaining the highest level of protection for highest ranked assets.

(c) **Level 3.** Level 3 provides the highest protection achievable while maintaining directed level for higher ranked assets.

(2) **Levels of Engagement Effectiveness.** There are five levels of operational engagement effectiveness. The AADC normally establishes the required level for each defended asset on the DAL based on mission, enemy, terrain and weather, troops and support available – time available and civil considerations and the JFC directed levels of protection, including active and passive AMD measures. After a level is established, the defense design and firing parameters are developed. Levels of engagement effectiveness 0-4 are employed using tiers or methods of coverage with some employing multiple tiers and a variety of active and passive measures. Tiers are commonly categorized as upper and lower.

(a) **Level 0 (None)** — defined as the commander's decision to accept maximum risk where active defense forces provide no tiers of protection.

(b) **Level 1 (Low)** — for commanders that wish to provide some level of protection throughout their defended areas. One tier of protection will be used.

(c) **Level 2 (Medium)** — the normal level of defense used to provide specific military assets using a single tier of protection. While a single tier operating alone normally provides Level 2, it may employ two integrated tiers of defense.

(d) **Level 3 (High)** — defined as the appropriate level of defense for assets that require a more robust level of protection than Level 2. Level 3 normally employs two tiers but may use one tier operating independently. This also may include areas where coordination between upper and lower tiers is used to defend a common asset.

(e) **Level 4 (Very High)** — defined as the maximum defense for high priority assets. This level normally requires two tiers operating together in an integrated defense. This may include areas where coordination between upper and lower tiers is used to defend a common asset.

b. The DAL must be continuously assessed, especially in a dynamic, multi-phased campaign. The AADC normally delegates further assessment of the DAL to a working group/coordination board with appropriate staff and component representation (e.g., a DAL reprioritization board or DAL synchronization board). The assessment and recommended adjustments to the DAL are presented to the AADC for concurrence and forwarding to the JFC for final approval. Changes to the DAL should be anticipated with changes in phases of an operation/campaign. Normally, DAADC(AMD) will chair the working group/board for assessing the DAL for changes.

See FM 3-01.2/AFTTP(I) 3-2.30, Multi-Service Tactics, Techniques, and Procedures for Joint Air Operations Center and Army Air and Missile Defense Command Cooperation (JAOC/AAMDC)*, for detailed discussion of CAL and DAL, including sample worksheets for the CVT process.*

SECTION F. ENABLING CAPABILITIES

19. Special Operations

SOF core tasks should be considered when planning counterair operations. SOF can aid counterair operations by providing information or by destroying or disrupting air and missile assets, bases, logistic sites, and C2 facilities. For example, SOF can locate enemy assets (especially those being concealed/camouflaged) behind the lines, provide terminal guidance (e.g., laser target designation) for joint air attacks, and provide post-attack assessment. They may be used for OCA operations, but they are not a recognized DCA asset. To ensure proper ID and reduce the potential for fratricide, SOF liaisons must ensure proper procedures are in place for CID of SOF teams and aircraft during cross-border operations or those considered behind enemy lines or in enemy rear areas. Often special liaison or trusted agents will coordinate/facilitate SOF movements, including using ACMs for activation of joint special operations areas or restricted fire areas.

For more detailed information on SOF, refer to JP 3-05, Doctrine for Joint Special Operations.

20. Information Operations

a. Counterair operations are most effective when they are conducted from a position of information superiority. IO can provide significant capabilities against OCA targets sets such as C2 systems, air defense nodes, missile sites, and airfields/operating bases. Adversary IO vulnerabilities related to their offensive and defensive air and missile systems should be identified as early as possible in the planning process. Denying the adversary knowledge of friendly counterair capabilities and their locations is integral to effective counterair operations and is achieved via the full range of IO measures, such as operations security (OPSEC), military deception, and EW.

b. IO can be employed offensively to degrade the adversary's situational awareness and their decision-making processes, disrupt vital air defense information transmissions and their capability to synchronize AMDs, disrupt their ability to coordinate attacks, and deny them reconnaissance and surveillance capabilities. Military deception can be used to lead the adversary into making erroneous decisions and wasting resources, or to mask friendly force intentions.

c. EW is normally a multifaceted very high demand/low density capability. EW aircraft are especially heavily tasked to support a myriad of joint missions. **An EW coordination cell (EWCC), or its functional equivalent, is required within the JAOC, separated from but integrated with the IO cell, to coordinate requirements, set priorities for EW assets, and take advantage of reachback capabilities within the reprogramming centers that support specialized and self-protection EW systems.** Airborne EW is especially important to SEAD operations throughout a campaign.

d. The development and updating of the joint restricted frequency list (JRFL) is critical to successful counterair operations because of the EW and IO implications. All joint operations require a JRFL to identify and deconflict/synchronize friendly force use of frequencies. This list is a critical tool in the management of the use of the electromagnetic spectrum, and it specifies protected frequencies that should not be disrupted either because of friendly use or friendly exploitation. The JRFL is maintained and promulgated by the J-6 through the joint frequency management office (JFMO) in coordination with the J-2, J-3, and the JFC's EW staff or an EWCC, if delegated. The JFMO must manage all frequencies used by the joint force. For defensive purposes, the JRFL is a means of preventing radio frequency interference among friendly users. Frequency deconfliction through the use of the JRFL is also a key to a successful coordinated defense against enemy C2-attack operations. EW planners must know what frequencies to protect from enemy EW action. The JRFL is constantly being modified and a daily EW deconfliction message normally is used to protect frequencies from jamming or other forms of manipulation. Experience has shown that during intense SEAD operations, friendly forces have been erroneously attacked because their electronic emitters were not recognized as friendly.

For more details regarding the JFRL and JFMO and a broad, in-depth discussion on EW, see JP 3-13.1, Electronic Warfare.

For more information on IO see JP 3-13, Information Operations.

21. Space Operations

a. The enabling capabilities that space operations bring to the joint force are significant for counterair operations. Space forces provide BM launch warnings and attack assessments, launch locations, predicted headings and impact areas, global and theater-/JOA-wide communications, current and forecast weather information, space based intelligence, surveillance, and reconnaissance (ISR), global positioning system (and navigation and timing assets for accuracy of precision munitions), and theater-/JOA-wide ID/CID systems support. Space assets also may be used to facilitate emission control and jamming/spoofing when conducting SEAD missions.

b. The JFC normally designates a SCA as the focal point for coordinating user requirements for space support with USSTRATCOM. Each geographic CCDR has a network of space operators resident on staffs at multiple echelons. Their primary purpose is to serve as weapons and tactics advisors for space systems (national, civil, commercial, military, and foreign) and for integrating space capabilities into joint force planning and employment. These individuals concentrate primarily on working the detailed activities of theater space operations.

For more information on space operations, see JP 3-14, Joint Doctrine for Space Operations.

22. Intelligence Support

a. Intelligence support for counterair operations begins with the JIPOE and IPOE processes. Ongoing intelligence support provides current, integrated, accurate, and timely all-source intelligence of adversary capabilities and activities developed from interface with existing national and theater intelligence sources. The intelligence system is vital to decisionmaking and must support the status, assessment, planning, warning, and JIPOE and IPOE functions, as well as target prioritization and engagement decisions. Intelligence elements should be tailored to support real time operations as well as contingency planning. Intelligence functions include collection management; combat assessment, including battle damage assessment from OCA efforts, indications and warning/early warning/launch warning, predicting weather effects, and providing the near real time data on enemy targets; operating bases; missile launch sites and hide sites; EW systems; C2 facilities; surveillance and control systems; and logistic and infrastructure support.

b. The JFC normally will be supported by a joint intelligence operations center where appropriate and by a national intelligence support team. Although the functional systems (sensors, decision support, or fusion centers and firing units) may be dissimilar, interoperable communications and software must be possible, including making allowances for systems of MNF members. Issues regarding the release of intelligence to MNF partners must be addressed as early as possible during counterair planning.

c. Increasing the readiness posture includes performing the vital operating functions that prepare weapon systems, ISR assets, and C2 nodes for the level of hostile activity anticipated. Once enemy air and missile activities are detected, the preparation and planning measures provide a capability for parallel defensive and offensive responses. Hostile air and missile activity observed and identified through sensor and surveillance systems (national, theater, and tactical) keys the C2 process that uses communications interfaces to provide near real time DCA and OCA responses. Data is made available in near real time to C2 centers, systems, and forces supporting counterair operations. Simultaneously, while enemy air and missiles are in flight, updated enemy launch locations and target database information are passed to the appropriate C2 and attack systems and launch warnings are provided to all units or commands within the theater.

For more information, see JP 2-01, Joint and National Intelligence Support to Military Operations.

23. Surveillance and Reconnaissance

a. Situational awareness relies on joint force ISR capabilities. Those capabilities are provided by air-, land-, space-, and sea-based platforms, but the air and space platforms provide the bulk of ISR support for counterair. As a group, ISR platforms with multidimensional sensors provide the most accurate "picture" of the adversary. ISR assets are generally high demand/low density and require careful planning for their utilization.

b. The backbone of ISR capabilities is a theater ISR concept of operations based on a coherent collection strategy that fully integrates and optimizes the use of all organic, multinational, commercial, and requested national or interagency ISR assets. The capabilities include both periodic reconnaissance and continuous battlespace surveillance. While some of the information requires processing for intelligence, other producers can be directly linked to commanders and OCA or DCA forces as required. This is especially true for time-sensitive targeting and decisionmaking. Depending on the capabilities of the sensor and surveillance systems and the source and quality of the intelligence, cueing of additional systems may be necessary to provide more refined adversary air and missile threat data to ensure accurate targeting and assessment. National or theater sensor and surveillance assets may be able to detect, footprint, or search areas that will then require more refined ISR activities by theater and tactical assets. Friendly aerial reconnaissance, ground surveillance systems, and other intelligence assets requiring cueing are focused rapidly to achieve the necessary accuracy for IPOE targeting objectives.

c. The JFACC normally is responsible for airborne ISR for the JFC and the JAOC has an ISR division for planning and execution. Additionally, the USSTRATCOM Joint Functional Component Commander for Intelligence, Surveillance, and Reconnaissance is the pathway for support from DOD and national ISR assets.

Refer to JP 2-01, Joint and National Intelligence Support to Military Operations*, for more details regarding surveillance and reconnaissance.*

24. Air Refueling

a. AR is an important force multiplier and enabling function for counterair and joint air operations. AR greatly increases the range, endurance, and payloads of aircraft conducting counterair and other joint air operations.

b. During a combat operation, the highest priority for intratheater AR units is normally supporting combat and combat support aircraft executing joint air operations. This is especially true during the initial phases of a conflict. Theater AR assets bolster the security of air assets by allowing them to be based beyond the range of enemy threats. AR increases the endurance of air combat support assets such as AWACS type aircraft, JSTARS aircraft and are among the many crucial airborne platforms used to help manage, direct, and conduct combat operations. Depending upon the operation, extending range or endurance could reduce the number of sorties required, decrease ground support requirements at forward locations, and may reduce the number of aircraft required to be deployed to a theater.

c. AR not only allows combat aircraft to greatly extend their range of operation (which may allow them to operate from bases further away from the conflict that may be more secure and have existing infrastructure and logistic capabilities that are critical to military operations) and endurance (making possible longer "on-station" times, thereby decreasing the number of aircraft needed to meet objectives), but may also allow some types of aircraft to carry a larger payload on initial takeoff by decreasing the amount of onboard fuel required. Fuel necessary for mission range requirements is on-loaded after takeoff by either pre-strike or post-strike refueling (or both). The ability to increase an aircraft's weapons

Air refueling assets can greatly increase the range and endurance of aircraft conducting offensive counterair missions deep into enemy territory.

load multiplies the combat force and combat efficiency of that aircraft. **A lack of airspace for AR tracks can limit the amount of combat and combat support sorties the JFACC/AADC is able to schedule and execute. AR support is essential for both DCA and OCA.**

Refer to JP 3-17, Joint Doctrine and Joint Tactics, Techniques, and Procedures for Air Mobility Operations*, for more details regarding AR operations.*

CHAPTER IV
OFFENSIVE COUNTERAIR PLANNING AND OPERATIONS

"After all, the great defense against aerial menace is to attack the enemy's aircraft as near as possible to their point of departure."

Winston Churchill
Memo of 5 Sept 1914

1. General

OCA operations normally have a high-priority as long as the enemy has the air and missile capability to threaten friendly forces and the JFC does not have the degree of air superiority desired to accomplish the objectives required for the end state. OCA operations reduce the risk of air and missile attacks, allowing friendly forces to focus on their mission objectives. The preferred method of countering air and missile threats is to destroy or disrupt them prior to launch using OCA operations conducted over enemy territory.

SECTION A. OFFENSIVE COUNTERAIR PLANNING

2. General

a. OCA planning begins with JIPOE and IPOE and considers the JFC's assessment of the overall air and missile threat, target database, ROE, objectives, priorities, missions, available friendly forces, and the weight of effort or force apportionment decision. IPOE enhances the commanders' ability to find targets, task attack forces, and assess their effectiveness. Considerations include the enemy's air and missile operating areas, signatures, capabilities, and deployment and employment procedures. IPOE attempts to provide a comprehensive picture of the enemy activity, terrain, and weather within the theater/JOA and generally requires planning for surveillance and reconnaissance in support of intelligence collection.

b. Through centralized planning and direction, the JFACC synchronizes/deconflicts OCA operations with DCA and other joint operations and relies on robust C2 systems for decentralized execution. Decentralized execution allows components and units to exercise initiative, responsiveness, and flexibility within their command authorities to accomplish their tasks. Operations against fixed targets require emphasis on preplanning, accurate and timely intelligence, target selection, time over target, and published ROE. OCA operations against mobile targets or TSTs (e.g., SAMs, TBM or CM launchers) also require preplanned procedures that can be used quickly to assign the optimum weapon system relying on integrated C2 systems for as close to real time control as possible. This emphasis on planning enhances mission effectiveness while minimizing potential for fratricide and interference with other operations.

c. Reliable and secure C2 systems are needed to ensure timely and accurate integration, planning, responsiveness, and close coordination. **These systems represent the common threads that tie all joint operations together and they must be aggressively protected from enemy interference.**

3. Offensive Counterair and the Joint Air Operations Plan

a. The preponderance of OCA operations are conducted with joint air forces/capabilities that are integrated in action through the JAOP. OCA planning is an integral part of this overall joint air operations planning. The air estimate process has six phases that result in the JAOP. While the phases are presented in sequential order, they can be worked either concurrently or sequentially. The phases are integrated and the products of each phase are checked and verified for coherence. Figure IV-1 illustrates the six phases. The following explains the process in regards to OCA planning, not each phase.

(1) The process begins with mission analysis (i.e., analyzing the JFC guidance, the situation, resources, and risks involved). Mission analysis provides the data that is used to answer the essential question about an operation. The JFACC uses the mission analysis to produce air objectives that support the JFC's campaign. In general terms, the focus of OCA is to attain and maintain the JFC's desired degree of air superiority in the operational area. This requires that both an enemy's offensive and defensive air and missile capability be made combat ineffective to some degree. **Specific OCA objectives and desirable effects must be clearly defined and measurable so the JFACC can assess whether or not OCA operations are achieving them while avoiding undesired effects.**

(2) After establishing OCA objectives, the JFACC uses the data from the mission analysis to examine resources and risks, as well as enemy COA (both known and anticipated) to arrive at the best option for integrating OCA into the JFACC's COA for joint air operations.

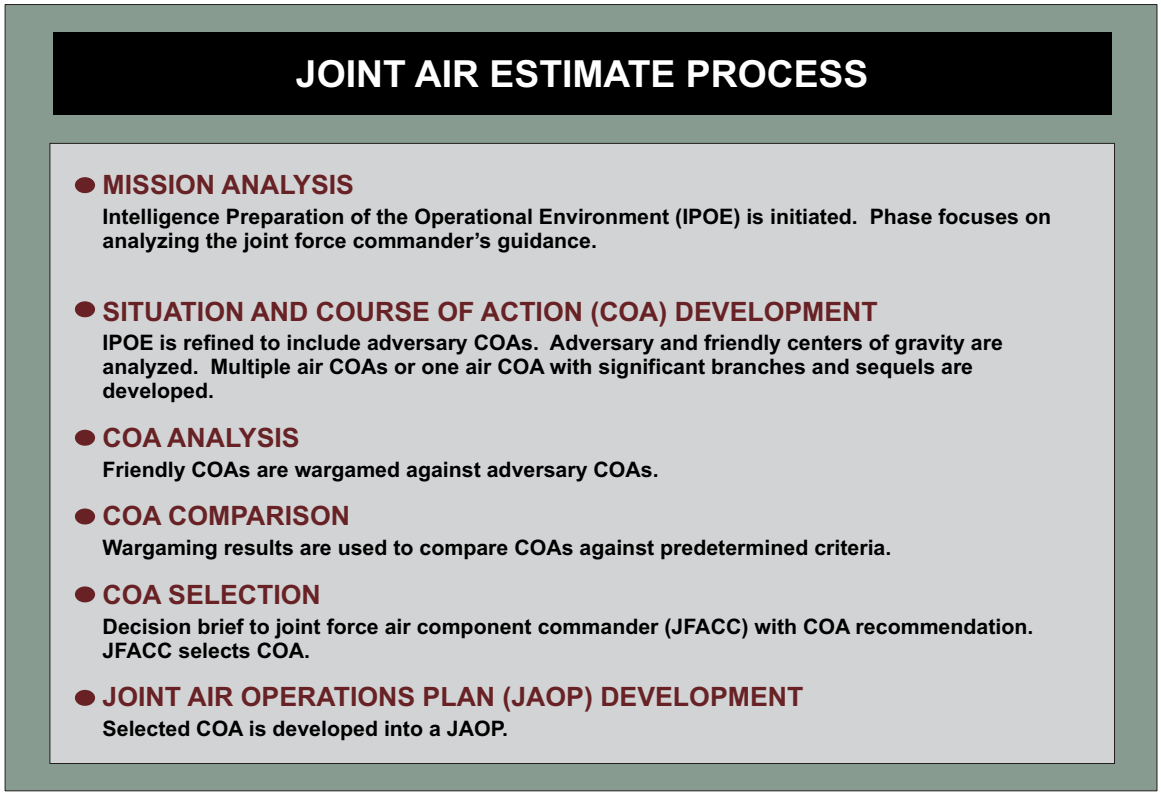

Figure IV-1. Joint Air Estimate Process

(3) The JFACC's COA is approved or amended by the JFC and gets translated into the final JAOP that includes details on the integration of OCA into the overall air operations plan. The JAOP should identify objectives by priority order, describing in what order they should be attacked or otherwise neutralized, the desired effects, and the weight of effort required to achieve them. For OCA operations, the JAOP should account for current and potential offensive and defensive threats and indicate the phasing of joint air operations. The results of the planning process also are incorporated into the daily master air attack plan (MAAP) (see Figure IV-2 for MAAP development).

(4) The MAAP forms the basis of the daily ATO. During MAAP development OCA resources are allocated to accomplish specific tasks. OCA planning considers the operational context and environment and the results from current operations. Planners will work with specialty teams, component liaisons, and unit representatives, incorporating and synchronizing OCA aspects of the air operations directive, joint prioritized integrated target list, threat situation, joint prioritized collection, forecast weather, weapons system availability, air refueling, and weapons employment options. The MAAP has sufficient flexibility to adapt to the changing situation throughout the theater/JOA. Planners adjust to the changing availability of joint assets to ensure each task or target is assigned the best available capability.

b. OCA planning includes targeting the enemy air and missile threats. Targeting is the process of selecting targets and matching the appropriate response to them, accounting for operational requirements and capabilities. The following seven criteria are normally used to establish targets and their priorities.

(1) Objective - the degree to which targets contribute to the OCA objectives.

(2) Threat - determining the need and urgency to counter the threat posed by the target.

(3) Expected Effect - the degree the enemy capability can reasonably be expected to be affected by a successful action.

(4) Delay in Effect - the time between the initial engagement and the desired effect.

(5) Risk Calculation - the probable risk to attacking forces.

(6) Forces Available - the composition of forces required to achieve the desired results.

(7) Assessment - the ability to determine the effect of an attack on enemy capability.

Refer to JP 3-60, Joint Targeting*, for a detailed discussion of the targeting process.*

c. OCA targets should be attacked on the surface prior to launch and as close to their source as possible. However, based on the JFC's priorities and ROE, many mobile targets, especially TSTs, may be sought and attacked wherever and whenever they are found. Target identification

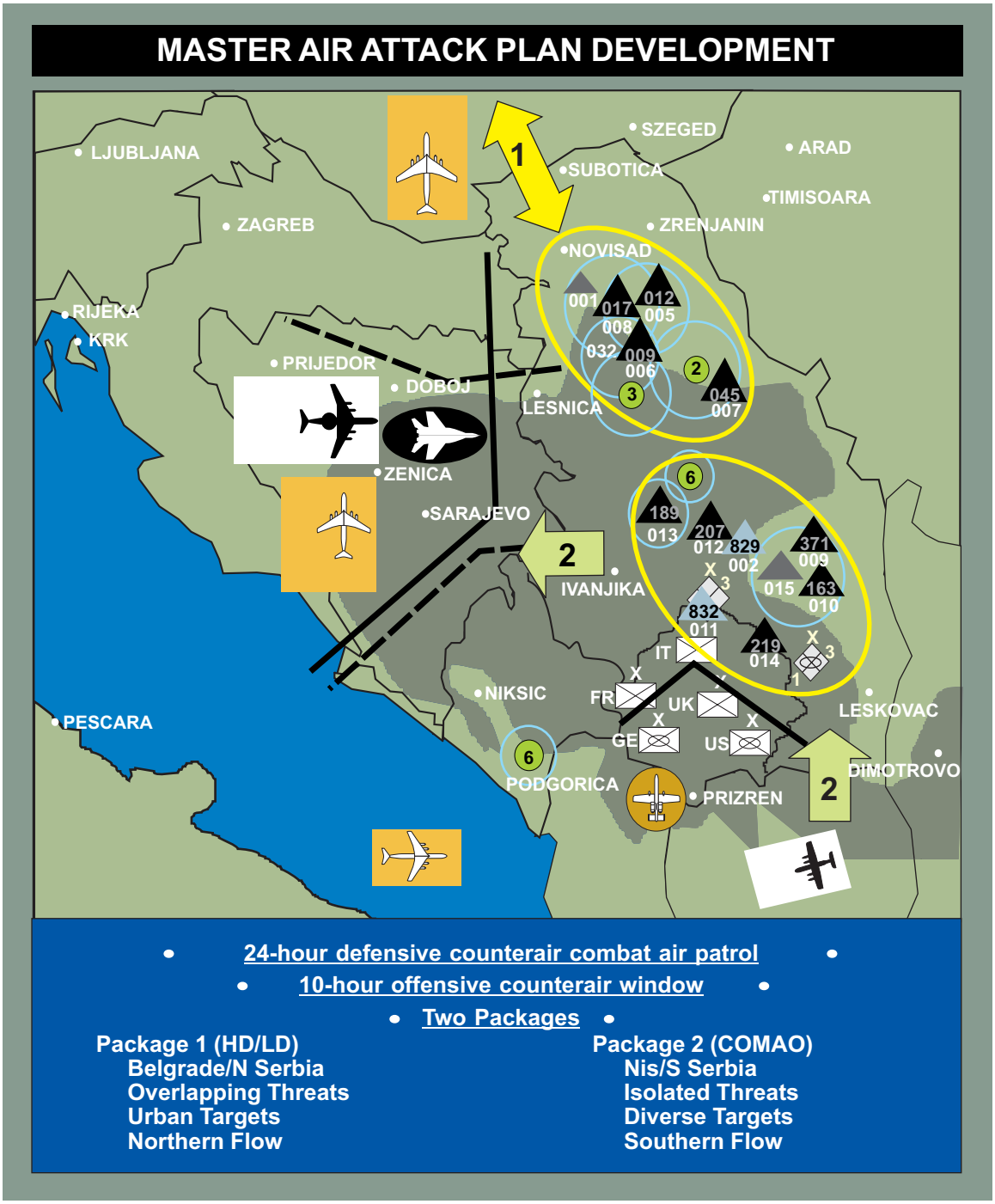

Figure IV-2. Master Air Attack Plan Development

and planning should start prior to hostilities, but target data should be as current as the latest intelligence information. Target defenses, to include active and passive systems, also should be evaluated to determine vulnerability. Commanders should consider the following target systems for OCA operations:

IRAQI INTEGRATED AIR DEFENSE SYSTEM DURING DESERT STORM

"The underlying principle of the suppression of enemy air defense (SEAD) plan was to attack KARI [nickname for Iraqi integrated air defense system] as a whole. It would not be necessary to kill all the surface-to-air missile (SAM) sites; it would be enough, if the coalition SEAD assets intimidated the Iraqis to the point that those running SAM sites would refrain from turning radar on. Finally, the plan to suppress enemy air defenses aimed to defeat the SAM threat, so that allied aircraft could operate at medium altitudes which would minimize the threat posed by Iraqi antiaircraft artillery. In effect, planners looked to maximize the inherent inefficiencies and frictions within KARI. They believed that the Iraqis could not operate effectively without centralized direction; once the system began to break down at the center, it would no longer function at all."

SOURCE: The Gulf War Air Power Survey, Volume II

(1) **WMD.** Not all WMD may be considered an OCA target, but the JFC must establish priorities, the ROE, and clear guidance for targeting WMD. There may be different targeting for WMD that are not ready to be employed (i.e., in storage), are ready to be employed (i.e., on or in the vicinity of aircraft or missile delivery systems), or are in areas requiring special attention. When planning OCA against WMD targets, risk assessments should consider the unique nature of the collateral damage. Also, escalation concerns may place some enemy WMD and delivery capabilities on the restricted target or no-strike lists.

(2) **Missiles and Support Infrastructure.** OCA operations are most effective against missiles prior to their launch. The preemptive destruction of missiles, launch facilities, storage facilities, and other support infrastructure greatly limits subsequent missile attacks. OCA assets may also be rapidly retasked to destroy TSTs such as mobile launchers.

(3) **Airfields and Operating Bases.** Destruction of hangars, shelters, maintenance facilities, and other storage areas as well as petroleum, oils, and lubricants will reduce the enemy's capability to generate aircraft sorties. Runway or taxiway closures often prevent use of the airfield for short periods, thus preventing subsequent takeoffs and forcing returning aircraft to more vulnerable or distant locations. Direct attacks on crews and maintenance personnel facilities may reduce sortie generation rates longer than attacks on the infrastructure of airfields and operating bases.

(4) **Aircraft.** Target aircraft include enemy fixed-wing and rotary-wing aircraft (manned or unmanned), whether in flight or on the ground. Destruction of these targets will limit enemy attacks, observation, and defensive capability.

(5) **C2 Systems.** C2 systems are critical to the employment of forces and should be given a high priority during OCA operations. Remembering the desired effect may be to take away the enemy's C2 capability while retaining the ability to reconstitute it after the conflict. C2

Attacking offensive counterair targets as close to their source as possible reduces the risk of air and missile attacks.

systems include intelligence gathering, warning and control systems (i.e., GCI sites, early warning and acquisition radars, space-based systems, and other sensors), as well as their supporting facilities. Fixed site, hardened facilities are usually easier to locate than mobile systems. Attacks against fixed sites can also be preplanned with appropriate weapons to increase the probability of kill. Attacks should also be considered against airborne, maritime, and ground-based C2 platforms, as well as against systems supporting space-based platforms. IO capabilities should be employed offensively for the desired effects whenever possible.

(6) **Naval Platforms.** Enemy naval platforms capable of employing aircraft or TMs are also important OCA targets. Destruction of these platforms limits the enemy's ability to conduct air and missile attacks in the littoral or possibly influence vital sea lines of communications.

(7) **Air Defense Systems and Enemy Forces.** Disruption or destruction of enemy air defense systems and the personnel who control, maintain, and operate them significantly limit enemy self-defense efforts.

4. Offensive Counterair Assets

a. The effectiveness of OCA operations depends on the availability and capabilities of friendly assets. The choice of a particular weapon system or capability may depend upon the situation, target characteristics, desired effects, threats, weather, and available intelligence. Whenever possible and within the ROE, commanders should employ weapon systems that

minimize the risk to friendly forces and noncombatants. Primary offensive assets are shown in Figure IV-3.

b. **Aircraft.** Offensive aircraft provide the advantages of air-refuelable manned systems (flexibility of control), night and all-weather capable, long-ranges, tailorable weapons loads, precision weapons, and some may be capable of self-defense. Offensive aircraft include bombers, air-to-air fighters, fighter-attack, EW aircraft, and fighters especially configured for SEAD. Additionally, there are the warning and control, reconnaissance, aerial tankers, special operations, and airlift aircraft that directly support the offensive aircraft or other forces capable of OCA operations.

c. **Unmanned Aircraft Systems.** UASs can be used for attacks, surveillance, reconnaissance, deception, jamming, and decoy of enemy forces and air defense systems. UASs are preprogrammed or remotely piloted and often provide intelligence to friendly forces while providing confusing and erroneous information to the enemy. Some UASs are night-capable and carry precision guided weapons. UASs may cause the enemy to expend weapons and other air defense resources to evaluate or attack them. Airspace control can be a problem when mixing unmanned aircraft (UA) and manned aircraft in close proximity.

d. **Missiles.** Missiles that may be used for OCA include surface-to-surface, air-to-surface, and air-to-air guided missiles as well as air-, land-, and sea-launched cruise missiles (SLCMs). CMs provide the capability to attack very heavily defended targets when the risk to aircrews is not acceptable.

e. **Special Operations Forces.** SOF conduct direct action, provide terminal guidance, observe attacks, and collect intelligence through special reconnaissance. SOF may strike enemy targets that are normally beyond the capability of other conventional munitions.

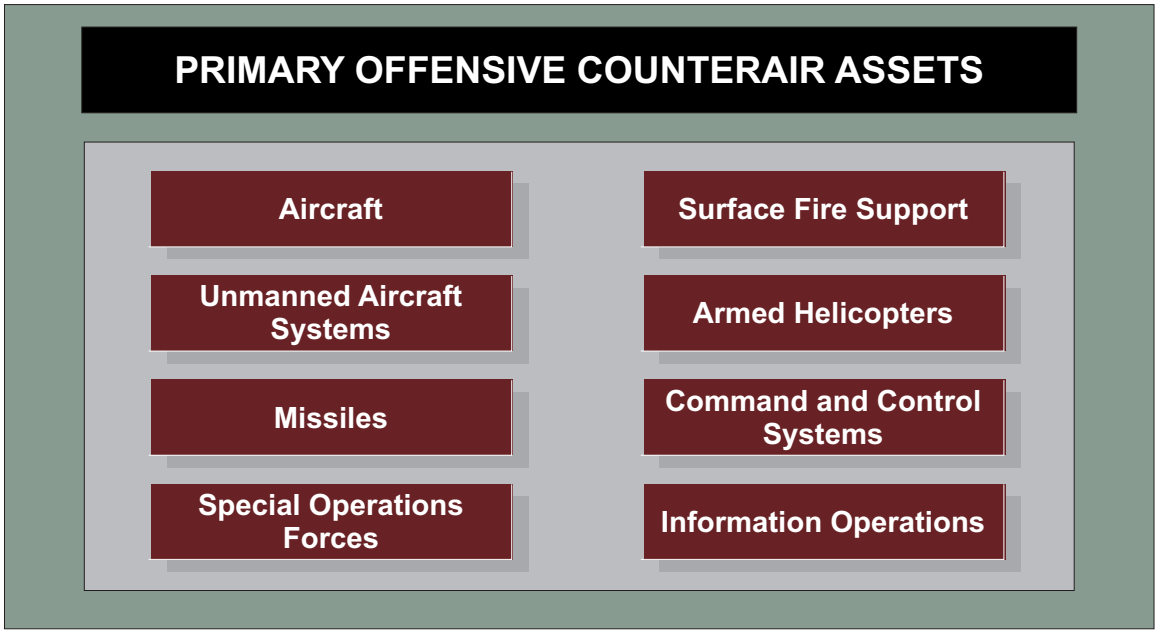

Figure IV-3. Primary Offensive Counterair Assets

Examples include targets concealed by difficult terrain, underground facilities, or "safe haven" targets. SOF may also be used to locate, positively identify, and designate targets for other forces. Coordination with the SOLE at the JAOC is critical to synchronize/deconflict operations and avoid fratricide for SOF working behind the lines and/or in the land/maritime AO.

f. **Surface Fire Support.** Artillery and naval surface fire support may be used during OCA operations if enemy targets are within range. Surface fire may provide the safest and fastest method of attacking targets.

g. **Armed Helicopters.** When apportioned by the JFC and made available for tasking, these assets may be placed in direct support of the JFACC with mission-type orders for attack operations. Army attack helicopters are considered maneuver units for the land forces.

h. **C2 Systems.** C2 support for OCA includes early warning and surveillance systems, radars, ID/CID systems, communications systems, and other surface-, air-, and space-based sensors. These systems provide indications and warning, intelligence, targeting data, and C2. C2 systems are vital to counterair.

i. **Information Operations. IO can also generate nonlethal effects that have proven to be essential to OCA operations.** The core capabilities of IO can save valuable aircraft sorties during a high tempo air war. Many OCA targets, such as C2 nodes, missiles, and support infrastructure, and airfields/operating bases can be affected by various IO actions that include computer network operations and EW. Some IO capabilities afford the JFACC access to targets that may be inaccessible by other means.

5. Enemy Air Defenses

a. Enemy air defenses may range from simple to the most advanced IADS. For the purpose of this discussion, consider an enemy IADS that could include detection, C2, and weapon systems integrated as effectively as a US IADS to protect those assets critical to achieving their strategic, operational, and tactical objectives. An IADS attempts to provide a seamless capability to destroy, disrupt, or neutralize ISR and air and missile attacks. To degrade effectiveness of friendly OCA operations, enemy defensive tactics may include jamming aircraft navigation, communications, target acquisition systems, and precision weapons guidance systems. IADS have become increasingly complex and can differ widely in terms of organization, sophistication, and operational procedures. As a target system or number of target systems, the enemy IADS needs to be analyzed in depth to avoid its strengths and exploit its weaknesses.

b. **Command and Control.** Traditionally, many potential adversaries exercise rigid centralized control over air defense activities. Air defense commanders located in centralized C2 posts provide warning and cueing, assign targets, and control weapons readiness using overlapping and redundant communication links. However, some potential adversaries may employ a decentralized system where multiple nodes may have the redundancy to direct the entire IADS. Radio-based C2 is now being supplemented by combinations of communications over landline (cable/fiber optics), microwave, cellular, satellite, and internet systems.

c. **Employment.** Mobile air defense elements allows echeloning of forces in depth and include tactical and strategic SAM and AAA systems. Technologies are now available that allow passive detection with little warning prior to weapon engagements. Known adversaries are adept at camouflage, concealment, and deception, complicating the targeting process. SAM forces have become more mobile and lethal, with some systems demonstrating a "shoot-and-move" time in minutes rather than hours or days. Modern SAM systems have been dramatically improved in both range and capability and some older systems have received substantial upgrades that continue to make them serious threats to US forces. Long-range SAMs are usually located near high-value targets and provide area and point defense coverage. However, their range and mobility mean these systems could provide air defense coverage over the forward edge of the battlefield at various stages of the conflict and threaten friendly airborne warning and control, surveillance, and reconnaissance and targeting platforms well into friendly airspace. Point defenses and maneuver units may use short-range air defenses (SHORADs) including SAMs, multiple calibers of AAA, and man-portable air defense system (MANPADS) that may be guided by infrared or radio frequency methods. For enemy maneuver units, the SHORAD will probably present a primary threat against air assault, air mobility, and close air support operations. The proliferation and lack of warning of some SHORAD systems make them a serious threat to all fixed- and rotary-wing aircraft operating at low and medium altitudes, especially during takeoff and landing. OCA planners should expect MANPADS and AAA coverage wherever enemy forces are encountered.

SECTION B. OFFENSIVE COUNTERAIR OPERATIONS

6. General

a. The preferred counterair employment strategy is to execute OCA operations prior to the launch of air and missile threats and as close to their source as possible. Prior planning and accurate and timely intelligence are keys to locating and attacking OCA targets as well as their supporting elements. Under decentralized execution, units tasked for OCA operations should have the latitude to plan, coordinate, and execute their operations. OCA operations may be conducted by any component of the joint force with the requisite capability using aircraft, missiles, SOF, surface fires, or ground forces.

b. Counterair operations can be preemptive or reactive, but sustained efforts may be required to reduce or neutralize hostile air and missile capabilities until the desired degree of air superiority is attained for the JFC. OCA missions may be planned or immediate. Missions against planned targets are tasked in the ATO and rely on continuous and accurate intelligence to identify them at particular locations and times. Immediate targets for counterair are those unanticipated/unplanned targets, such as mobile TSTs, that fall outside the ATO cycle and require immediate action. Minutes often define the timeline when these targets are vulnerable to attack. Those targets requiring immediate action cannot be effectively attacked unless responsiveness and flexibility is built into the targeting process and the ATO. OCA may require provisions for ground/airborne alert aircraft, on-call surface fire support, and diverting aircraft with suitable weapons for the target/target system.

c. To ensure unity of effort, conservation of force, and fratricide prevention, attacks within a designated surface AO requires coordination with that supported component commander, as designated by the JFC. For a land AO, the land force commander normally establishes a fire support coordination line (FSCL) as a permissive FSCM. Attacks short of the FSCL are controlled by the land force commander. Beyond the FSCL, coordination and restrictive measures are used to avoid conflicting or redundant operations. Forces attacking targets beyond the FSCL must coordinate with all affected commanders to allow necessary reaction and avoid fratricide, both in the air and on the ground. Generally, the ATO process provides sufficient coordination for planned targets beyond the FSCL. If permitted by specific JFC guidance, ROE, and preplanned procedures, immediate targets may be attacked quickly using whatever information and coordination that can be provided through the C2 system. Liaison elements can be very useful for coordination of operations against immediate targets. Under exceptional circumstances, if approved by the JFC, the inability to perform coordination may not preclude attacking the target, with the commander of the attacking force assuming the increased risk of fratricide. Therefore the component commanders must plan and coordinate procedures for operations against immediate targets, especially those in the land or maritime component AOs. OCA operations include attack operations, SEAD, fighter escort, and fighter sweep shown in Figure IV-4 and discussed below.

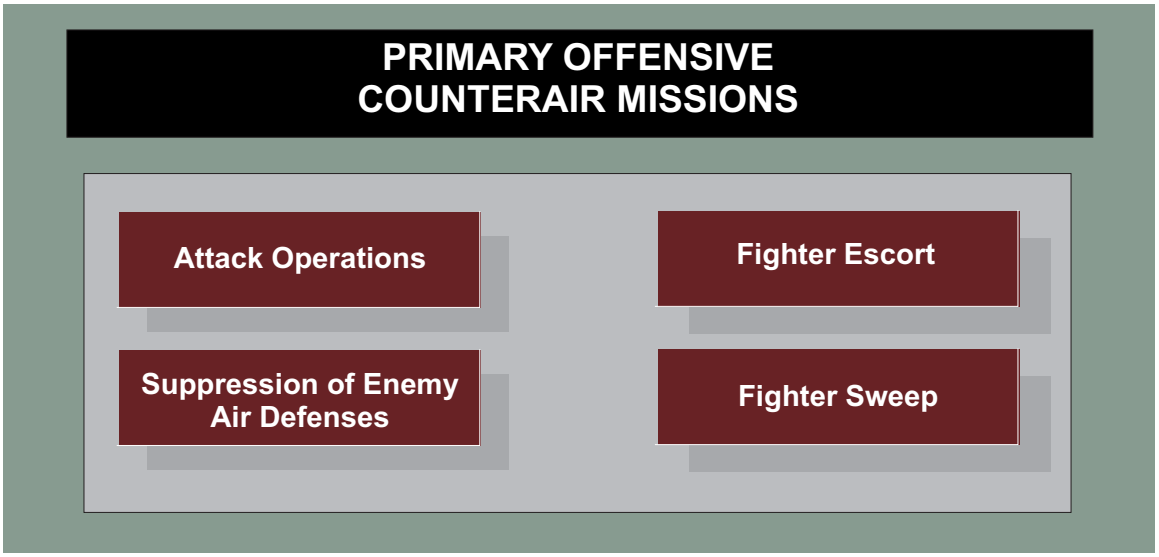

Figure IV-4. Primary Offensive Counterair Missions

DESERT STORM OCA

The Iraqi Air Force posed both a defensive threat to Coalition air operations and an offensive threat to Coalition forces in the region. In addition to a defensive capability, the Iraqi Air Force had a chemical weapons delivery capability and had used precision-guided missiles.

Initial targeting of the Iraqi Air Force during Operation DESERT STORM emphasized the suppression of air operations at airfields by cratering and

mining runways, bombing aircraft, maintenance and storage facilities, and attacking [command, control, and communications] facilities. Coalition planners anticipated the Iraqis initially would attempt to fly large numbers of defensive sorties, requiring an extensive counterair effort. Air commanders also expected the Iraqis to house and protect aircraft in hardened shelters. An attempt to fly some aircraft to sanctuary in a neighboring country also was expected, although the safe haven was thought to be Jordan, rather than Iran.

SOURCE: Final Report to Congress
***Conduct of the Persian Gulf War*, April 1992**

7. Attack Operations

a. OCA attack operations are offensive actions against surface targets that contribute to the enemy's air power capabilities. All components normally have forces capable of supporting attack operations. Some Service components refer to attack operations as strikes. The objective of attack operations is to prevent the hostile use of enemy aircraft and missiles by attacking them and their supporting elements and infrastructure with the fires necessary to create the desired effects.

b. **OCA Attack Operation Targets.** Attack operations target the following components of enemy air and missile capability (not in a prioritized order):

(1) Air and missile unit C2 nodes/centers.

(2) Aircraft on airfields and in shelters.

(3) CMs and BMs on fixed and mobile launchers.

(4) Airfield runways and taxiways.

(5) Major IADS C2 facilities.

(6) Operations and maintenance facilities, equipment, and personnel.

(7) Logistic support (e.g., fuel storage, munitions depots, electrical power generation and transmission).

(8) ISR and target acquisition systems.

(9) Transportation infrastructure serving garrisons/deployment sites for mobile/moveable TMs (e.g., bridges, tunnel adits, rail choke points).

c. **Resources**

(1) Assets used to support attack operations include fixed- and rotary-wing aircraft, CMs, SOF, other surface-to-surface fires, ground maneuver forces, EW and other IO capabilities, and ISR systems.

(2) Attack operations are highly dependent upon predictive and developed intelligence. Because of the difficulty in detecting highly mobile launch systems, a seamless network of C2 systems and sensors should be employed to share information and support near real time targeting and attack. National sensor systems normally will be required to augment theater air and surface based systems. Space systems provide tactical information to assist in determining enemy missile launch points and tracking. Additionally, intelligence collected by these systems can enable theater forces to anticipate hostile air and missile operations and determine their unit locations.

d. **Execution.** In addition to the JFACC's own Service component forces, the JFC may apportion additional component force/capabilities to the JFACC to support theater-/JOA-wide attack operations. The JFACC's recommendation and the JFC's decision on apportionment determine the amount of effort made available for OCA attack operations. Attack operations are generally against planned targets, but must be planned for potential immediate targets.

(1) **Planned Attack Operations.** Normally, OCA targets are nominated and prioritized through the joint targeting process. The JFC may have a list of approved TSTs that must be attacked at the onset of hostilities, or even prior to the onset of hostilities. Typically, JFCs organize a joint targeting coordination board for determining apportionment of operational fires and shaping the battlespace in the theater/JOA, including fires supporting OCA attack operations. That board normally simultaneously addresses at least three ATO cycles that are either being planned, about to be executed, or in execution.

(2) **Immediate Attack Operations.** The quicker the joint force can locate, identify, and target the enemy air and missile threats, the quicker they can be attacked and defeated. Immediate missions are conducted against emerging mobile targets and TSTs and require the execution of mutually supporting tasks (e.g., detection, acquisition, identification, tracking, attack, and assessment). These operations rely on sensor systems, a responsive near real time sensor management and communications network, and weapon systems capable of attacking targets as soon as adequate targeting information is available.

(3) **Target Acquisition.** Acquisition and tracking systems may utilize cueing from wide-area and local surveillance systems and receive warning data from other intelligence sources. Acquisition supports target identification, discrimination, and timely engagement by accurately locating and monitoring targets and transmitting information relative to their movements.

(a) **Target Detection.** In the case of BMs and CMs, detection can be accomplished through identifying launch signatures or intelligence sources such as measurement and signature intelligence or signals intelligence. To support attack operations in all environments, joint forces should minimize the effects of enemy countermeasures while capitalizing on distinctive equipment

For offensive counterair attack operations, the joint force air component commander makes an effective decision for employing the best capable attack asset.

signatures. Surveillance capabilities should integrate national level intelligence with theater level capabilities. Space, sea, air, and ground-based area and point surveillance sensors also will be key to establishing a comprehensive surveillance network. Detection involves a systemic search of areas of interest identified during the IPOE. After detection, warning or location data should be passed immediately to joint and component intelligence and operations centers, executing units, and air and surface search equipment. Simultaneously, tactical warnings also should be provided to potential friendly-targeted assets.

(b) **Identification.** ID of aircraft and TMs (or strategic BMs) and their supporting nodes requires management of target movement data, determination of the type of system employed, and discrimination of the launch and support systems from decoys. Target ID also requires the use of predictive intelligence, including the ID of potential future target locations, area limitation analysis, and automated cueing of sensors to threatening targets.

(4) **Attack.** Observed enemy activity should trigger timely counterair execution. Targets identified in the IPOE database are included in the JFC's plan for preemptive strikes or operations at the onset of hostilities. **Targets acquired are attacked in accordance with JFC guidance. The goal is to attack immediate targets as they present themselves.**

(5) **ATO.** The ATO should be flexible enough to deal with immediate attack operations. The combat operations division of the JAOC is responsible for adjusting the ATO in order to deal with real time developments in the battlespace. One method to permit this flexibility is

designating selected forces in the ATO as either ground alert or airborne alert. These on-call assets can then be tasked real time against immediate counterair targets.

(6) **TSTs.** Prior planning, delegating authority, and having the appropriate C2 systems can streamline decision-cycles for attacking counterair TSTs.

Refer to JP 3-60, Joint Targeting*, for a discussion of targeting and TSTs.*

8. Suppression of Enemy Air Defenses

a. SEAD is activity that neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive or disruptive means. SEAD must be an integral part of all planning and air operations, but the SEAD requirement will vary according to mission objectives, system capabilities, and threat complexity. SEAD operations are based upon the JAOP and the components' suppression needs, target priorities, and availability of SEAD assets.

b. SEAD objectives are specified by the JFC, who will consider the unique capabilities of each component to contribute to counterair operations. Traditionally, there are three categories of SEAD, each of which reduces attrition and creates more favorable conditions for friendly air operations: AOR-/JOA-wide joint air defense system suppression, localized suppression, and opportune suppression. For each category, there are two means of executing SEAD, destructive and disruptive.

c. SEAD assets are often used in conjunction with other air operations/missions (i.e., air interdiction, OCA attack, airborne operations) when surface air defenses are a factor. Specially trained aircrew and specially equipped aircraft are designed for SEAD missions, especially against an IADS. SEAD dedicated aircraft normally are equipped with special electronic detection and electronic countermeasures (ECM) equipment, deceptive expendables (chaff, flares, or decoys), and antiradiation missiles (ARMs) for use against emitting radars. During major operations, SEAD assets normally are too valuable to be used for missions without a SEAD requirement. Other fighter-attack and multi-role fighter crews normally are trained to support the SEAD mission, especially against the enemy air defense infrastructure.

d. **Threat.** Air defense threats can encompass many national or multinational systems normally integrated into an IADS. Potential adversaries' IADS have become increasingly complex and can differ widely from country to country in terms of organization, sophistication, and operational procedures. An adversary's IADS needs to be analyzed in depth with an eye to potential strengths and weaknesses, especially seams in coverage. The goal is to identify command structure, air defense doctrine, early warning and tracking capabilities, C2 reliability/redundancy, and defensive weapons systems. SEAD operations target the following components of an IADS:

(1) IADS C2 nodes/centers.

(2) SAM sites.

(3) AAA.

(4) Early warning and fire control radars and GCI sites.

(5) SAM carriers and storage bunkers.

(6) Air defense operations and maintenance personnel.

e. **Resources.** Each component has its own capabilities for SEAD. Most are normally oriented toward their mission areas and they assume the immediate responsibility for suppressing enemy air defense threats expected against their forces. The components with dedicated, specialized aircraft and aircrews have the best potential and options for SEAD. Some of these options include aircraft with special detectors, jammers and electronic countermeasures (ECM) equipment, ARMs, and precision-guided munitions. Dedicated SEAD forces may be supported by aircraft with precision or unguided air-to-surface munitions. Land forces may use EW equipment, attack helicopters, and direct or indirect fires (including mortars, artillery, missiles, or naval surface fire support). SOF may be used for direct action (attack) or providing terminal guidance for air attacks. Additionally, space assets may also be used to facilitate emission control and jamming/spoofing when conducting SEAD missions.

f. **Means of SEAD Execution.** SEAD operations are accomplished through destructive and disruptive means.

(1) **Destructive Means.** Destructive means seek the destruction of the target system or operating personnel. However, this may place large demands on the available combat capabilities/forces. Examples of destructive SEAD capabilities are bombs, air-to-surface and SSMs, ARMs, air scatterable mines, cluster bomb units, and artillery.

(2) **Disruptive Means.** Disruptive means temporarily deny, degrade, deceive, delay, or neutralize enemy surface air defense systems. Disruptive means may be either active or passive.

(a) Active means include electronic attack, directed energy, electromagnetic jamming, electromagnetic deception, expendables (chaff, flares, and decoys) and tactics such as deception, avoidance, or evasive flight profiles. In addition, UASs can be used to actively employ disruptive means.

(b) Passive means include emission control, camouflage, infrared shielding, warning receivers, and material design features, to include stealth technology.

g. **Categories of SEAD Execution.**

(1) **AOR-/JOA-wide Air Defense System Suppression.** AOR-/JOA-wide suppression is conducted against specific enemy air defense systems throughout the AOR/JOA to degrade or destroy their major capabilities/effectiveness. It targets high payoff air defense

assets that result in the greatest degradation of the enemy's total system. It normally is a major effort to destroy/disrupt the whole enemy IADS and therefore may have a higher priority than localized suppression. **Typically, destruction of key C2 nodes has the most disruptive effect on an IADS.** In conjunction with SEAD, efforts are normally made to destroy/disrupt enemy equivalent airborne warning and control system aircraft. The immediate objective is to destroy or disrupt the integration and synchronization of the enemy AMDs. The duration and level of disruption depends upon the JFC's objectives and the sophistication of the IADS.

(2) **Localized Suppression.** Localized suppression operations normally are confined to geographic areas associated with specific targets or transit routes for a specific time. Under localized suppression, SEAD aircraft normally escort other aircraft to protect them from a surface-based air defense threat in that sector. Localized suppression normally takes place in different areas and times throughout the AOR/JOA. Although planned to protect specific operations or missions, localized suppression may also support AOR-/JOA-wide air defense suppression.

(a) **Planned Localized Suppression.** The SEAD process is based upon the JFACC's JAOP and the determination of suppression needs, target priorities, and availability of appropriate suppression means. Localized SEAD coordination occurs at all echelons. Localized suppression requests are processed from the lowest echelon of command to the highest using the appropriate air control system. Liaison elements located in the JAOC aid this effort. A requesting echelon or component must first consider what organic SEAD systems are available. When the requirements exceed the capability or availability of organic systems, the requesting component passes the requirements through its respective chain of command to the JFACC for resolution. Units requesting air support are required to identify known or suspected air defense systems that could threaten the mission. SEAD requests also will include these defensive systems and identify other supporting targets that likewise cannot be engaged with organic capabilities/forces.

(b) **Immediate Localized Suppression.** Threat assessment and suppression requirements, usually destructive in nature, must be made quickly when processing a request for SEAD air support. Procedures for requesting immediate localized suppression are similar to close air support. If a surface force cannot support the SEAD requirement, the component control center passes the request to the JFACC through the appropriate air control system for immediate SEAD support considerations.

(3) **Opportune Suppression.** Opportune suppression is unplanned and includes aircrew self-defense and attack against surface-air defense targets of opportunity. The proliferation of highly mobile air defense weapon systems, coupled with deception and defensive tactics, will lead to an increase of opportune suppression. Any movement by air defense systems from targeted locations will change localized suppression into opportune suppression. The JFC will establish ROE for opportune suppression because SEAD operations require correct identification of enemy systems to prevent fratricide, especially when launching ARMs against sources of unknown, spurious electronic signals. **Realizing that the window to engage highly mobile targets may be fleeting, concern should be given to establishing ROE and detailed planning that will allow the rapid prosecution of threats before they have the opportunity to move or conceal themselves again.** Opportune suppression is a continuous operation involving

immediate response to acquired targets of opportunity. In cases where air assets are not available or not required, the component commander establishes priorities for opportune suppression. These priorities are forwarded from the designated fire support coordinator at component-level headquarters to the executing commands. The following are the different types of opportune suppression.

(a) **Aircrew Self-defense.** An aircraft commander has the inherent authority and is obligated to use all necessary means available and to take all appropriate actions in self-defense of the aircraft and other US forces in the vicinity. Nothing in the SROE, theater-specific ROE, or SPINS limit this inherent right and obligation. For further guidance, see CJCSI 3121.01B, *Standing Rules of Engagement/Standing Rules for the Use of Force for US Forces*.

(b) **Targets of Opportunity.** SEAD targets of opportunity are those enemy air defense systems detected by surface or airborne sensors or observers within range of available weapons and not yet targeted. Many SEAD efforts by surface forces may be against targets of opportunity. Surface and air weapon systems may suppress air defense targets of opportunity whenever capabilities, mission priorities, and ROE permit. Such suppression operations must be in accordance with established rules and FSCMs. The purpose of SEAD ROE is to enhance effective SEAD while minimizing risks to friendly forces.

(c) **Targets Acquired by Observers or Controllers.** Combat elements may often be in good position to acquire SEAD targets of opportunity. Observers, spotters, controllers, and liaison officers from the components have the authority to request suppression for SEAD targets of opportunity. Such personnel may include joint terminal attack controllers, airborne

Component commanders will use their organic assets to locate, identify, and attack suppression of enemy air defenses targets within their area of operations whenever possible.

controllers and observers, TACPs, Marine assault support coordinators, artillery forward observers, UAS operators, Army fire support teams and combat observation/lasing teams, and STRYKER platoons. The observers or controllers will forward these requests through their respective fire support channels. Requirements should first be passed to suppression systems that belong to or support the unit acquiring the target because they can respond immediately. If the suppression requirement exceeds the capabilities of the ground forces, the immediate request will be sent via the air request net to the component control centers.

(d) **Targets Acquired by Aircrews.** When aircrews have acquired SEAD targets of opportunity but have not engaged them because of mission priorities, weapons limitations, or SEAD ROE, they pass the information to the agency controlling their mission. **This agency should immediately pass the targeting data through the appropriate C2 channels to the battle manager/operations center of the force component capable of targeting the threat.**

h. **Surface Component SEAD Capabilities.** Based on the JFC guidance, the land and maritime surface components' fire support elements and fire support coordination centers will determine the weapon systems available to conduct SEAD. Examples of these capabilities/forces include field artillery, mortars, naval surface fire, attack helicopters, EW, and SSMs. To ensure unity of effort and conservation of force, components need to coordinate their SEAD activities within their AOs with the JFACC to ensure they meet mission requirements and do not interfere with other planned operations. Component liaison elements, such as the BCD located in the JAOC, can assist localized suppression operations by coordinating the means to request surface fire support. **A rapid and free exchange of SEAD target information between the JFACC and other component commanders is required for effective surface suppression.**

SEAD IN "THE STORM"

On the morning of 17 January [1991], an EA-6B from Marine Tactical Electronic Warfare Squadron Two provided electronic warfare support for Marine, Navy and Royal Air Force strike packages attacking strategic targets at the Al-'Amarah and Az-Zubayr command and control sites, as well as the Az-Zubayr railroad yards and the Al-Basrah bridges across the Tigris River. These targets were heavily defended by interlocking belts of surface-to-air missiles (SAMs) and antiaircraft artillery (AAA). Iraqi fighters also were a potential threat. This was a dangerous mission — among the first daylight strikes of the war. Long before they approached the targets, the EA-6B crew started to work. The first enemy radar that came up was quickly jammed. Shortly after, however, additional radars were noted searching for the strike groups. Jamming of Iraqi long-range early warning radars allowed the strikers to approach undetected. However, Iraqi ground control intercept radars as well as target tracking radars simultaneously began probing the Coalition strike package. The EA-6B crew quickly introduced intense electronic jamming into all modes of the Iraqi air defense system, which prevented the vectoring of enemy fighters. They also forced SAM and AAA systems into autonomous operation, uncoordinated by the command and

control system which greatly reduced their ability to locate and track Coalition aircraft. To accomplish this, the EA-6B crew did not attempt evasive action but placed themselves into a predictable, wings-level orbit which highlighted their position amidst the beaconing (sic) and jamming strobes of the enemy radars. The severe degradation to radio transmissions caused by jamming interference limited the EA-6Bs ability to receive threat calls, making them vulnerable to enemy aircraft. Nonetheless, the crew remained on station, enabling all Coalition aircraft to strike the targets, accomplish the missions, and return home without loss or damage.

SOURCE: 3rd Marine Aircraft Wing Award Citation cited in DOD Final Report to Congress, *Conduct of the Persian Gulf War*, April 1992

(1) Component commanders will use their organic assets to locate, identify and attack SEAD targets within their AOs and areas of interest whenever possible. They continually update lists of potential SEAD targets, including target location, desired effects, timing, and sequence of attack. In many cases, however, only the JFACC has assets to specifically find and identify or attack certain SEAD targets so the components must request SEAD support. Component liaison elements normally are responsible for consolidating their component's SEAD requirements and priorities for action.

(2) A request for air support should identify known or suspected enemy air defense threats to, from, and around the target area. Within their capabilities, each echelon handling the request refines and updates threat data. The request for air support contains this updated data, along with the type of suppression desired by the requesting component. For example, during the planning and execution of close air support, TACPs, and other fire support agencies identify potential local SEAD targets and request SEAD fire support.

Refer to FM 3-01.4/MCRP 3-22.2A/NTTP 3-01.42/AFTTP(I) 3-2.28, Multi-Service Tactics, Techniques, and Procedures for Suppression of Enemy Air Defenses*, for additional detailed information regarding SEAD.*

9. Fighter Escort

a. Fighter escort missions are critical to offensive air operations and for protection of HVAAs. As an OCA mission, fighter escort sorties are normally flown over enemy territory to protect other primary mission aircraft from enemy fighters en route to and from a target area during offensive missions (i.e., for air interdiction, OCA attack, SEAD, an airborne operation). Fighter escorts may protect airlift, AR, EW, C2, search and rescue, and SOF aircraft from enemy fighters. Fighter escorts also may be used as a DCA mission, as in the case of HVAA protection.

b. **Offensive Fighter Escorts.** Joint air operations may require air-to-air capable fighters be used as escorts to protect friendly aircraft over enemy territory from attacks by enemy fighters. After considering the mission requirements, the required capabilities of the fighter escorts (i.e.,

Fighter escorts protect against hostile fighter aircraft and are normally assigned to protect specific friendly aircraft.

speed, sophistication of weaponry, data links, guns) are determined by the operational/tactical commanders responsible for air operations. Those air operations packages also may be supported by specially equipped and trained SEAD assets when surface air defense threats are also a concern.

c. **Defensive Fighter Escorts.** Fighter escort missions may be planned as DCA missions to protect HVAAs (i.e., AWACS, JSTARS, Rivet Joint, Compass Call, Cobra Ball, Global Hawk, and U-2) from potential enemy fighter attack over neutral or friendly territory.

d. **Threats/Targets.** The primary threats for fighter escorts include any enemy aircraft with a capability to attack and disrupt/destroy the primary mission aircraft. Escort fighters target only those airborne aircraft that threaten the primary mission. Fighter escorts in conjunction with their supported aircraft must avoid the direct threat of enemy surface-based air defenses (unless the fighters are escorting a SEAD package). If SAM/AAA threats cannot be avoided, the threat and risk to the primary mission and fighter escorts requires SEAD support.

e. **Resources.** Dedicated air-to-air or multi-role fighters are best suited for the escort mission. However, any fighter with air-to-air ordnance can conduct escort missions. Escort missions are more effective when ground and airborne early warning or GCI radar assets are available for situational awareness and threat warnings. Airborne C2 (battle management) assets normally are required for rapidly synchronized/complex air operations. The duration of the escort mission may require aerial refueling support for the escorts, even if the primary mission or other support aircraft do not. IO support, apart from SEAD support, also may be required to disrupt the

effectiveness of enemy communications and information systems that support their acquisition, tracking, and interception capabilities.

f. **Execution.** Air planners, along with JFACC/JAOC intelligence staff, must evaluate the threat posed by the adversary counterair forces and determine the type and size of fighter escort force required, because the same air assets are usually shared for DCA operations. The planners also must coordinate the support required by the escort force (i.e., AR, EW, C2). The specific responsibilities of the fighter escort force must be clear to all participants. In direct support, their mission is to protect the primary mission force, and not necessarily attrite enemy aircraft. **If the enemy chooses not to attack because a fighter escort is present, then the objective of fighter escort has been met.** Conversely, escort fighters must exercise caution against being drawn away from the escorted force by diversion or decoys, thereby leaving that force vulnerable to other enemy aircraft.

10. Fighter Sweep

a. The fighter sweep is defined as "an offensive mission by fighter aircraft to seek out and destroy enemy aircraft or targets of opportunity in a designated area."

b. Fighter sweeps are conducted by fighter/fighter-attack/multi-role fighter aircraft. Normally, fighter sweeps are conducted in order to achieve local or JOA air superiority. Based on the targeting potential, AWACS and ISR assets should be used in support for more effective acquisition of targets.

c. The need for fighter sweep missions versus attack operations will depend on the air and missile threat and the objectives of the JAOP. Intelligence should help OCA planners determine the proper force mix (air-to-air and air-to-ground) for a fighter sweep in a given sector.

d. **Threats/Targets.** The fighter sweep is a flexible air mission because threats/targets can be anywhere in the allotted sector. Fighter sweeps should normally be planned into areas where the threat from surface-based air defenses are minimized, through tactics or attrition. This enables the concentration of OCA assets on the destruction of enemy aircraft, missiles, and other such soft targets of opportunity.

e. **Resources.** Package aircraft normally are those fighter/bomber aircraft used for OCA attack, air interdiction, close air support, strategic attack, and fighter escort missions. Friendly early warning and GCI radar sites, and AWACS aircraft should be tasked to support the mission. This may be especially important when aircraft with beyond visual range ID systems and weapons are used or when significant numbers of enemy aircraft may be encountered. SEAD requirements will be determined by enemy surface-based air defense capabilities and the JFC's acceptable level of risk. Based on mission duration and distances, aerial refueling also may be required. EW may be used to enhance the element of surprise/disruption and give the attacking force a tactical advantage.

Fighter aircraft may perform a fighter sweep to seek out and destroy enemy aircraft or targets of opportunity.

f. **Execution.** Although a flexible air mission, the fighter sweep involves employing fighter aircraft over hostile territory. Fighter sweep missions normally should follow a series of OCA attack and SEAD operations aimed at neutralizing/destroying the enemy offensive and defensive aircraft and missiles threats. However, a sweep may be synchronized with a rapid series of OCA operations (including attack, SEAD and escort missions), or into other offensive air operations (i.e., air interdiction, strategic attack). Normally, detailed planning and coordination, good intelligence, and robust C2, including real time threat warnings, are essential to prevent surprises by the enemy and to ensure synchronization/deconfliction with other friendly operations. Ground or airborne warning and control assets enhance overall effectiveness, but if those supporting resources are not available, execution of autonomous fighter sweeps with fighters using only their own fire control radar and ID systems are possible. Flexibility being key, some fighter sweeps may be just air-to-air capable fighters looking for airborne targets; others can be multi-role fighters hunting air and ground targets.

58TFS FIGHTER SWEEP/ESCORT DURING DESERT STORM

"The plan's essence — as far as the 58th was concerned — was that twenty F15s, in line with strategically positioned four ships from several squadrons, were going to be the first air-to-air fighters to sweep across the Iraqi border after the STEALTHs, F-15E bombers, and TOMAHAWK missiles had made a surprise attack mostly on Baghdad's vital command and communications centers, hopefully knocking them out and, with them, the country's air defenses.

Then, as the bombers, done with their surprise missions, sped back to safety south over the border, the EAGLES, including two four ships from the 58th would charge in over their top, engaging any enemy fighters . . . and clearing a path for the waves of conventional nonstealth bombers and other warplanes that would be following."

SOURCE: *Wings of Fury* by Robert Wilcox, 1996, pp 220-221

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CHAPTER V
DEFENSIVE COUNTERAIR PLANNING AND OPERATIONS

"Find the enemy and shoot him down, anything else is nonsense."

Manfred Baron von Richtofen
1917

1. General

a. DCA operations consist of active and passive AMD measures executed through a joint C2 infrastructure. The AADC normally is responsible for developing an IADS by integrating the capabilities of different components with a robust C2 architecture. **Because of their time-sensitive nature, DCA operations require streamlined coordination and decision-making processes.**

b. The AADC uses assigned campaign plan tasks to develop the AADP with the coordination of Service/functional component commanders, MNF partners, and the JFC's staff. (See Appendix B, "Area Air Defense Plan Format"). The AADP is the integration of active air defense design, passive defense measures, and the C2 system to provide a comprehensive approach to defending against the threat. The AADP builds upon the DCA Estimate (see Appendix C, "Defensive Counterair Estimate Format") and should address command relationships, the adversary and friendly situations, the AADC's intent, concept of operation, and logistics and C2 requirements, as well as detailed weapons control and engagement procedures. The AADP must be closely integrated with the ACP and facilitate a streamlined decision and coordination process for DCA operations. Planners must understand they routinely will be required to modify the AADP due to the dynamic nature of joint counterair operations. Ideally, as the JFC's operation/campaign progresses and the AADP is refined, the combination of DCA and OCA operations should diminish the enemy's ability to conduct air and missile attacks, reducing the requirement for DCA operations and the threat to the JFC's freedom of action.

c. This chapter discusses AMD from the perspective of an AADC being responsible for DCA operations, whether or not a JFACC is also designated as the AADC and/or ACA.

SECTION A. DEFENSIVE COUNTERAIR PLANNING

2. General

Through promulgation of the AADP, the AADC implements theater-/JOA-wide DCA priorities, authorities, procedures, tasks, and actions approved by the JFC. The AADP is designed to be a plan of action for DCA operations, but it is a living document. RADCs/SADCs, if established, may be required, or may wish to provide supplements to the plan to reflect additional guidance or intentions.

3. Defensive Counterair Assets

a. DCA operations employ a mix of weapon, sensor, communications, and C2 systems integrated from all components into an IADS to protect friendly forces, assets, population centers, and interests from air and missile threats.

b. The integration of AMD systems provides efficient control and exchange of information to all DCA forces. Assets used in conducting DCA operations normally include fixed-wing aircraft, SAMs and AAA, and C2 systems, all networked into an IADS using a redundant and flexible C2 architecture with interoperable data links, voice command circuits, and common displays. Since DCA is by nature reactive, the first action belongs to the adversary and the IADS must be flexible enough to respond to the most challenging threats.

c. Surface forces possess the following type of SAM capabilities:

(1) Based on mission, enemy, terrain and weather, time, troops and support available, and civilian considerations, ARFOR AMD battalions are task organized under AMD brigades to protect JFC and/or ARFOR critical assets. AMD forces have short-range and medium- to high-altitude AD capabilities. They normally are configured with 2-4 missile battalions (HIMAD) and/or SHORAD. In addition, theater-level brigades, with HIMAD assets normally will be made available to the AADC for DAL protection, usually under C2 of the commander, AAMDC.

(2) Varying with the size of the MAGTF, MARFOR are equipped with long range radars, SHORAD weapons, and extensive C2 facilities.

(3) NAVFOR have DCA capabilities in a variety of ships including SAMs and the C2 potential for regional/sector AD commands. Aegis-equipped cruisers and destroyers will provide area (e.g., high-to-medium altitude air defense) and point (e.g., SHORAD) AMDs. In addition to those DCA capable ships, all surface combatants are provided with some self-defense capability (guns and/or missiles). Area defense capable ships normally will deploy as part of carrier or expeditionary strike groups. Some of the Aegis-equipped/command ships may be made available and assigned tasks in support of the AADC for C2 of air defense in a maritime or littoral area while remaining under the OPCON/TACON of the appropriate NAVFOR commander.

d. **Interceptor Aircraft.** The AFFOR, NAVFOR, and MARFOR possess fixed-wing aircraft capable of an air defense role. However, both the multi-role and air-to-air capable aircraft normally can be tasked against both DCA and OCA operations, dependent upon the JFC's daily air apportionment decision.

e. Other aircraft that are critical to DCA include the airborne C2, AR, signals intelligence, and EW aircraft.

f. When operating with MNF, a multitude of AMD capabilities (aircraft, interceptors, sensors, SAMs, ISR, and C2) are possible. Integration of those capabilities without creating a seam or hole in the air defense coverage is the challenge.

g. In addition to EW, IO assets and procedures can be essential to DCA operations because of the critical reliance on electronic and computer systems for sensing, passing, and displaying air and missile threat and defense information. Understanding that reliance, an enemy may attempt offensive IO against DCA assets.

4. Integrated Air Defense Systems

a. An IADS is not a formal system in itself but the aggregate of Service/functional component air defense systems comprising sensors, weapons, C2, communications, intelligence systems, and personnel, operating in a theater/JOA under the command of an AADC. Because the IADS is normally composed of different components, it requires significant integration and interoperability of communications and TDL architectures to generate its expected synergistic effects for the JFC. An IADS requires previous planning from command relationships through the communications networks for C2 of weapon systems integrated for DCA operations.

b. An IADS provides the best capability for mutual support and economy of force for the AMD of vital areas and protection of the joint force in general. Competing demands for DCA resources require detailed planning so that every asset is employed to the full extent of its capability. Developing an IADS enables a more effective and efficient use of those resources and requires adherence to the following essential principles:

(1) **Centralized Planning and Direction.** Centralized planning and direction is essential for controlling and coordinating the efforts of the DCA forces. It maintains unity of effort and optimizes the contributions of all forces.

(2) **Decentralized Execution.** Decentralized execution permits timely, decisive action by tactical commanders without compromising the ability of operational-level commanders to control DCA operations. Decentralized execution is essential because no one commander can control the detailed actions of a large number of units or individuals.

(3) **Planned Responses.** Planned responses support prompt, decisive tactical action by exploiting prior development, testing, and rehearsal of DCA operations.

(4) **Effective and Efficient Communications.** Not only interoperable and efficient communications networks but also superior information management are required for timely data and information exchange. Optimized network effectiveness maintains operational tempo by avoiding unnecessary communications, and supports decisionmaking.

(5) **Layered Defense.** A layered defense should provide multiple engagement opportunities, ideally beginning at the maximum range from friendly forces and areas, before attacking aircraft release their weapons and missile warheads can impact. This includes interception of enemy surveillance and reconnaissance/targeting aircraft. The layered defense normally includes land- or sea-based aircraft for extended intercepts, long- and medium-range SAMs, and SHORADs (including AAA and close-in

weapons systems). The layered defense normally includes support by necessary surface and airborne early detection and warning assets and electronic decoys/jammers and chaff.

(6) **360-Degree Coverage.** 360-degree coverage guards against unpredictable targets, pop-up targets, and multithreat/multiaxis attacks. Since the flight profiles of most BMs are very predictable, the specialized assets used for BM defense normally cover specific launch-space sectors or ballistic missile operating areas rather than 360-degrees.

(7) Early detection, location, ID, and tracking support prompt attack warnings and timely cueing of AMDs and they also enable prompt, informed decision support for engaging targets that may be TSTs.

(8) Design, administer, and implement alert and warning procedures and networks as required.

c. To ensure counterair situational awareness and enable decisionmaking, plans for an IADS must include the requirement for a reliable, consistent COP/CTP available in all major and supporting C2 facilities.

d. The heart of the IADS is the integrated forces/capabilities of the components under the AADC. Each Service/functional or subordinate JFC (including RADCs/SADCs) plans and executes a portion of the total DCA effort by coordinating with the other components, and conducting passive and active defense in accordance with weapon control procedures and measures established by the AADC and approved by the JFC. Subject to the authority of the JFC, each component commander within a joint force does the following in support of DCA operations:

(1) Coordinates and prioritizes their DCA operations and needs with the JFC and other component commanders through the AADC.

Note: The commander responsible for the JSAs within the JOA will coordinate with the AADC to ensure those areas are covered by the AADP, and should ensure a joint security coordinator liaison officer is located at the JAOC or whichever facility is the prominent C2 node for the IADS.

(2) Employs AMD weapons in accordance with the ROE and the AADP.

(3) Coordinates and deconflicts the employment of forces with other subordinate commands. Coordination for combat airspace control may be facilitated by collocating key airspace control facilities, AMD, and fire support coordination organizations.

(4) Coordinates/provides airspace control, as required, in designated areas in accordance with the ACP. Is prepared to assume airspace control in other areas when combat or other factors degrade the ACS.

(5) Forwards requests for ACMs in accordance with the ACP.

(6) Develops detailed airspace control instructions, plans, and procedures in accordance with ACP guidance. Keeps these detailed instructions, plans, and procedures consistent with JFC-approved ACP.

(7) In support of the IADS, provides necessary facilities and personnel for airspace control functions in assigned areas and identifies those facilities and personnel for inclusion in the ACP.

e. It is the responsibility of the JFC's communications system officer, the J-6, to plan, oversee, and maintain the IADS C2 architecture. This includes all voice communications networks and the JDN.

(1) **Joint Data Network.** The JDN is essential to the IADS. The JDNO is responsible to the JFC, through the J-3 with support from the J-6, for all JDN operations, including the intelligence network, ground network, sensor network, and MTN. Each of those networks has a responsible manager. The JDNO ensures interoperability and integrates joint force information systems that provide the input to the CTPs and the COP. Although closely associated with DCA operations, the networks administrated by the JDNO are critical to tasks throughout the entire operational area and for every component. The JDNO may be located with the JFC or JFACC.

(2) **Joint Interface Control Officer.** Under an IADS, the challenge of managing the joint force MTN led to the requirement for a JICO. The JICO cell is responsible for planning, establishing, and maintaining the MTN and provides a CTP input to the JDN for integration into the COP. The JFC, with recommendations from the JICO through the JFACC/AADC, may require a RICO/SICO for each RADC/SADC. The RICO/SICO reports to the RADC/SADC to develop and maintain their portion of the CTP, and ultimately for the COP. RICOs/SICOs will coordinate with and answer to the JICO for planning and execution functions that cross regional boundaries or impact the theater-wide JDN. The JICO may recommend resolution of architectural and data coordination issues between RICO/SICO cells. For more detailed information on the JICO, see CJCSM 3115.01A, *Joint Data Networks (JDN) Operations.*

ROYAL AIR FORCE FIGHTER COMMAND, BATTLE OF BRITAIN 1940

Fighter Command was the apex of a command and control network which unified the different elements of fighter aircraft, radar and ground defences into a complex system of defence which gave it a formidable striking power and effective operational flexibility. Bentley Priory was the heart of this system and it received information on incoming hostile aircraft, relayed on secure landlines from the radar stations, to its Filter Room. Once the direction of the plots was established, the relevant Group Operations Room was alerted, where the Group commander would decide which of his sectors would intercept.

SOURCE: British Imperial War Museum Internet Exhibit

Refer to FM 3-01.15/MCRP 3-25E/NTTP 3-01.8/AFTTP(I) 3-2.31, Multi-Service Tactics, Techniques, and Procedures for an Integrated Air Defense System*, for a discussion of IADS.*

5. Enemy Threats

a. Enemy threats comprise two main elements: aircraft (manned and unmanned), and missiles.

(1) Aircraft can include bombers, fighter-attack, fighter escorts, ISR, SEAD, EW, airlift (for airborne attacks), helicopters, airborne early warning, and AR aircraft. It should be noted that UA — UASs — are being developed with more technologically advanced systems and capabilities. They can duplicate some of the capabilities of manned aircraft for both surveillance/reconnaissance and attack missions. They can be small enough and/or slow enough to elude detection by standard early warning sensor systems and could pose a formidable threat to friendly forces.

(2) TMs include TBMs, CMs, and ASMs. Missiles pose a significant challenge since they are often difficult to detect and destroy after launch. They can be employed from long ranges and in all types of weather. BMs, whether employed in high or low altitude trajectories, also present unique problems, including high velocities and short reaction times for the defender.

b. C2 facilities (like other infrastructure targets; e.g., ammunition storage) are vital links in the enemy's system that enable them to generate combat power and attack through the air domain.

c. Air and missile threats vary in technological sophistication and capabilities; technology transfers and weapons proliferation complicate the ability to assess all potential threats with certainty. Many countries possess and continually upgrade modern combat aircraft, but an air force and its sustainment can be very expensive in comparison to a missile force. Based on improved technologies and increases in the number of available missile systems, the number of countries with both TM and long-range missile capabilities is likely to increase. Also, a mobile missile force can be dispersed to complicate it being targeted and employed from remote sites without the infrastructure, support, and manpower required for aircraft. The proliferation of CMs, TBMs, and UASs complicates the tasks of providing force protection and attaining air superiority.

d. The geographic CCDRs should specifically focus intelligence efforts on potential adversaries and their air and missile threats in their theaters and adjacent areas of interest. Emphasis should be placed on WMD capabilities and potential aircraft and missile delivery systems. Intelligence developed during peacetime planning and collected regularly, or as necessary, should prevent the strategic or tactical surprise of an unanticipated capability by a potential adversary. Intelligence can support ROE decision points for proactive force protection measures.

6. Identification and Tracking

a. ID and tracking relies on surveillance and reporting. Execution of efficient DCA operations requires a continuous surveillance and reporting system capable of near real time production and dissemination of the tracking data necessary for effective decisionmaking. Target track production is a sequential process that begins with the surveillance function. Near real time surveillance and threat analysis is dependent upon the ability to fuse all-source sensor data into an accurate theater/JOA attack assessment, whether from ground-, sea-, or air-based radars, or space-based sensors. As a track is detected, it is identified and labeled and this information is disseminated as rapidly as possible. The track data provided is sufficiently detailed and timely to allow decisionmakers to evaluate the track, determine the significance of the threat, and either designate DCA forces for interception or engagement or advise units of the passage of friendly aircraft.

b. **Surveillance Planning and Execution Considerations.** Detection, tracking, and ID are dependent upon the surveillance plan. The three most commonly accepted plans include mutual support (preferred method), track/report by exception, and track production areas (or a combination). Each has advantages, depending on the mix of surveillance sensors and platforms and their degree of interoperability.

(1) **Detection.** Tracking begins with detection. The types of sensors and their placement determine the detection capability of the IADS. Sensor placement is affected by the threat, threat axis, terrain, weather, time-distance analysis, defended assets, desired engagement zone, and surveillance requirements. Sensor placement also must consider accessibility, connectivity, force protection, mutual interference, and HN support.

(2) **Tracking.** The surveillance plan will contribute directly to the ability of the IADS to continuously and efficiently track airborne objects. Regardless of the surveillance plan adopted, interoperability for effective tracking and reporting can be difficult because of a number of anomalies in the systems. The surveillance and data link (reporting) planners must consider the following factors to minimize the effects of gaps in interoperability:

(a) **Track Deconfliction.** More than one sensor may detect and track a target. The assumption that all C2 participants will always see the same tracks, with the same identity, and in the same place, is not valid and leads to misunderstanding and mistakes. Robust voice communication among C2 agencies (ID authorities) is critical to resolving track discrepancies. Differences in sensor platforms can aggravate preexisting problems of miscorrelation and dual tracking. The following problems may result:

1. Tracks not updating/tracking aircraft.

2. Tracks appear to be tracking aircraft but are not.

3. Tracks that “swap” or “jump” from one aircraft to another.

4. IFF modes and codes swapped among tracks, conflicting their IDs.

5. Dual Tracks. "Dualing" is the occurrence of multiple tracks on one target resulting in an air picture with more tracks than actual aircraft. This occurs frequently within the IADS. Failure of some surveillance systems to correlate contacts with precise participant location and identification (PPLI) data (symbols) can also cause dual tracking.

(b) **Track Correlation Problems.** Correlation problems include varying size of correlation windows, auto-correlation system differences (or lack thereof), radar-measured altitude differences between systems, IFF conflicts by systems, sensor registration/gridlock problems, and lack of familiarization of the other Service system's capabilities and operations. Track correlation problems can create ID conflicts, which are dangerous and can result in loss of situational awareness and contribute to the risk of fratricide. **All combat systems introduce a certain amount of ambiguity into the "Link" and although TDL message standards are common to all Services, the implementation of those standards may be inconsistent and selective. Combat system software baselines and ID doctrine also can introduce uncertainty into shared data.**

(3) **ID.** ID is used to support current ROE in light of weapon systems capabilities. The AADC is responsible for developing IADS ID criteria (both procedural and positive) for JFC approval in the AADP, with specific instructions in the ATO and/or SPINS. Not all IADS participants may see the same ID-related information. This is dependent primarily on TDL system implementation, J-series versus M-series message standards, and operator display capabilities. Because of the different implementation of TDL messages, planners should consider limiting the number of track classification symbols (ID symbols) to reduce confusion and the potential for fratricide. Positive ID (either on-board or off-board) or visual ID nearly always will be part of the ID process. The AADC may use the following considerations when developing ID criteria consistent with and in support of the current ROE:

(a) IFF Modes (1-4 per the ATO).

(b) PPLI.

(c) Procedural measures (e.g., MRRs).

(d) A radar contact correlated with a voice (position) report from an air or ground control agency.

(e) Off-board/on-board CID systems.

(f) Visual ID.

(g) Point of origin.

(h) Track maneuvers (e.g., noncompliance with ACMs).

(i) Validated kinetics versus threat (speed and altitude with hostile intent/act).

(j) Formation assessment ("guilt by association"). Formation assessment is a procedural ID that can be used to identify all members in a group of targets. This group ID is based on the ID of at least one member of the group (using ID criteria). Factors such as similarity to known threat tactical formations and relative spatial relationships (distance, speed, and altitude) must contribute to the formation assessment ID of the group. Once the group has been identified and the group is observed to split, all contacts in each of the resulting groups maintain the ID. This ID methodology requires that one or more radar systems (e.g., fighter or surface) continuously monitor the group or groups during the split. The group is considered "continuously tracked" if not lost/faded for more than one radar sweep/cycle.

Note: Army AMD systems do not use group IDs and each track is evaluated using current ID criteria.

Note: Due to the recent National Security Agency decertification of the Mark XII Mode 4 system (Director, National Security Agency [DIRNSA] message 081811Z Oct 03) ID planners should refer to FM 3 01.61/Marine Corps Warfighting Publication (MCWP) 3-25.11/NTTP 6-02.4/AFTTP(I) 3-2.39, *Multi-Service Tactics, Techniques, and Procedures for Mk XII IFF Mode 4 Security Issues in a Joint Integrated Air Defense System.*

c. It is incumbent on the combat system making the ID (having ID authority) and the TDL operator to ensure tracks are correctly identified. Every opportunity within tactical timelines should be taken to resolve all track and ID ambiguities prior to engagement by firing units. Evaluation reports with details of tracking shortfalls may be researched at the Joint Fires Integration and Interoperability Team (JFIIT), which absorbed the Joint Combat Identification Evaluation Team. See the JFIIT website at https://jfiit.eglin.af.mil.

d. During plans development, the parameters and details for positive and procedural ID, auto-ID systems, formation assessment, and CID should be developed and approved by the JFC along with the ROE and promulgated as discussed in Chapter III, "Counterair Planning," Section D.

Refer to FM 3-01.15/MCRP 3-25E/NTTP 3-01.8/AFTTP(I) 3-2.31, Multi-Service Tactics, Techniques, and Procedures for an Integrated Air Defense System*, for a detailed discussion of the ID/CID process within an IADS.*

7. Air Defense Planning

a. **Planning Considerations.** Development of the AADP and planning DCA operations involves integrating friendly force capabilities and limitations against adversary vulnerabilities to achieve optimum results in a dynamic tactical environment. The factors that must be taken into consideration for planning are outlined below:

(1) **Mission Analysis.** The mission statement is the AADC's expression of what DCA forces must accomplish and why. During mission analysis, the AADC translates specified and implied tasks into missions for the component and subordinate commands with DCA assets. Intent of the JFC, the current situation, resources available and the desired end state contribute to the mission statement.

(2) **DCA Estimate.** Planners use the DCA estimate to evaluate how factors in each field of interest will influence the potential COAs, to provide information regarding their supportability, to recommend DCA priorities, and to form a basis for the AADP. The estimate provides the basis for planning current and future DCA operations and is developed in concert with the JFC's staff. See Appendix C, "Defensive Counterair Estimate Format."

(3) **Objectives.** The AADC develops an AADP to achieve DCA objectives that support the counterair effort to gain and maintain the degree of air superiority required by the JFC to satisfy overall campaign objectives.

(4) **Force Requirements.** The AADC determines the type and number of forces needed to sustain the DCA effort until the objectives are accomplished, understanding that some assets may be shared with and lost between OCA and DCA operations.

(5) **Logistics.** A comprehensive analysis of logistic capability is integral to support of DCA requirements. Planners must anticipate loses of critical items (e.g., fuel storage) and be aware of any agreements or CCDR directives that significantly alter responsibilities for logistic support.

(6) **Synchronization/Timing.** Synchronizing/deconflicting employment of capabilities/forces and matching appropriate weapons against enemy critical vulnerabilities are essential functions for the AADC.

(7) **Weapons Availability and Pairing.** Airborne targets may seem vulnerable to attack but may be impervious to certain weapons or electronic warfare systems. Planners must have a detailed understanding of enemy capabilities and friendly force DCA weapons and systems capabilities. They must analyze the threat from the perspective of correctly paired target-shooter adequacy of the DCA force. This will feed into logistic planning, CAL/DAL force allocation, and forces requests.

(8) **Force Availability.** Careful planning is required to ensure timely arrival and quick integration of DCA forces, and to synchronize use of assets for both DCA and OCA operations.

(9) **Economy of Force.** In conjunction with planned responses, proper sizing and composition of responses to enemy attacks/penetrations of friendly airspace is essential. Economy of force includes analysis of the probability of destruction/disruption, distances, weather, weapon system reliability, etc.

(10) **Operational Assessment.** A comprehensive, continuous operational assessment is an essential part of DCA planning. The AADC's staff must determine how to evaluate the results of

OCA and DCA operations to assist in identification of the decision points (e.g., points of attrition of enemy missiles or aircraft) regarding achievement of the operational objectives.

b. **Weapon Engagement Zones.** WEZs are a critical part of DCA planning because they represent part of the current defense posture against the air and missile threats. WEZs are established through the AADP and ACMs and can be changed as necessary. WEZs also represent the integration of airspace control with AMDs.

(1) A WEZ is defined as follows: "In air defense, airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with a particular weapon system."

(a) **Fighter engagement zone.** "In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with fighter aircraft."

(b) **High-altitude missile engagement zone.** "In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with high-altitude surface-to-air missiles."

(c) **Low-altitude missile engagement zone.** "In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with low- to medium-altitude surface-to-air missiles."

(d) **Short-range air defense engagement zone.** "In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with short-range air defense weapons. It may be established within a low- or high-altitude missile engagement zone."

(e) **Joint engagement zone.** "In air defense, that airspace of defined dimensions within which multiple air defense systems (surface-to-air missiles and aircraft) are simultaneously employed to engage air threats."

(2) A MEZ can include one or more HIMEZs, LOMEZs, and/or SHORADEZs.

Note: By definition, a SHORADEZ may be established within a LOMEZ or HIMEZ because the SHORADEZ has short range air defense weapons (e.g., short-range SAMs, AAA, and small arms).

c. **Active Air Defense Design.** DCA operations require not only the integration of all appropriate DCA forces/capabilities within a theater/JOA, but also their efficient and successful employment to protect selected assets and forces from attack. These operations are subject to the weapons control procedures established by the AADC. Defense against BMs, CMs, and aircraft each have unique requirements for active defenses. Planners must anticipate that there will not be enough resources to defend all assets and develop multiple options that may use a combination of weapon systems and

WEZs. When possible, the AADC should design a layered defense plan to allow multiple engagement opportunities for friendly forces.

(1) An active air defense include the following types of defensive coverage:

(a) **Area Defense.** Area defense uses a combination of weapon systems (e.g., aircraft and SAMs) to defend broad areas.

(b) **Point Defense.** Point defense protects limited areas, normally in defense of vital elements of forces or installations. For example, a SAM or AAA unit positioned to protect an airfield is considered point defense.

(c) **Self-Defense.** Self-defense operations allow friendly units to defend themselves against direct attacks or threats of attack through the use of organic weapons and systems. The right of self-defense is inherent to all ROE and weapons control procedures.

(d) **HVAA Protection.** HVAA protection defends airborne assets that are so important that the loss of even one could seriously impact US warfighting capabilities. HVAA aircraft include AWACS, Rivet Joint, JSTARS, Compass Call, Cobra Ball, Global Hawk, U-2, and others the JFC may deem appropriate. HVAA protection is performed by fighter aircraft using various CAP or escort tactics.

(2) The following tasks also should be considered when planning active air defenses:

(a) **Determine Surveillance Coverage Areas.** Defended airspace must be under continuous surveillance to facilitate early warning. The DCA planner should use a combination of air-, surface-, and space-based detection assets provided by the components to achieve this requirement. Adequate early warning of air and missile attacks provides the reaction time necessary for friendly forces to seek shelter or take appropriate action. Early warning of hostile air and missile attacks is vital for a layered defense.

(b) **Develop the Active Defense Fire Plan.** The objective is to provide the required level of protection specified in the CAL. Defense resources involve applying a mix of the following six employment guidelines, because not all may be required or possible to defend dependent upon the threat and DCA assets available:

1. **Mutual Support.** Weapons are positioned so that the fires of one weapon can engage targets within the dead zone of the adjacent weapon systems. For gun systems, this dead zone is usually small. For missile systems, the dead zone may be large and mutual support is a critical element. Mutual support can also cover non-operational units or units at lower states of readiness.

2. **Overlapping Fires.** Weapons are positioned so that their engagement envelopes overlap. Because of the many altitudes from which the enemy can attack or conduct

surveillance operations, defense planners must apply mutual supporting and overlapping fires vertically and horizontally.

3. **Balanced Fires.** Weapons are positioned to deliver an equal volume of fires in all directions. This is necessary for air defense in an area where the terrain does not canalize the enemy or when the avenue of approach is unpredictable.

4. **Weighted Coverage.** Weapons are positioned to concentrate fires toward the most likely threat direction of attack. Based on the tactical situation, a commander may risk leaving one direction of attack unprotected or lightly protected to weight coverage in a more likely direction.

5. **Early Engagement.** Sensors and weapons are positioned to maximize early warning and to engage and destroy aircraft and missiles before they acquire and fire on or damage the defended asset.

6. **Defense in Depth.** Sensors and weapons are positioned to deliver an increasing volume of fire as an enemy air or missile threat approaches the protected asset. Defense in depth reduces the probability that "leakers" will reach the defended asset or force.

(c) **Plan a MEZ.** Proper sequencing in the establishment of WEZs is critical to an effective IADS and DCA operations. MEZs established for surface defense are based on specific boundaries and weapons system capabilities. For the organic SAM capability of a surface force, the MEZ boundaries should be within the component AO, and for direct support the MEZ should cover the defended asset. The MEZ area must be large enough to allow early engagement of threats before they reach their firing range. ASM launchers should be "killed" before they can launch standoff munitions, UASs before they reach their sensors/weapons range of friendly targets, and CMs must have multiple engagement opportunities for an effective defense. Specify in the AADP, ACMs, SPINS, etc., what targets can be engaged in the MEZ and the weapons to be used.

(d) Consider the fact that maritime forces (e.g., carrier and expeditionary battle groups) are not "static" and they usually employ a "moving MEZ" with separate operational areas for air operations. In a littoral environment, amphibious operations may encompass a portion of the land AO and function as a MEZ. In this case, maritime combatants may be restricted by geography when defending selected coastal assets. Linking land-based SAM systems with maritime force generated search and fire control data can result in improved ability to defend the littoral areas of a theater/JOA.

(e) **Determine Surface-Based Defenses C2 Coverage and Fire Control.** DCA operations depend upon effective and redundant C2 planning. The IADS must integrate the ground-based C2 nodes, airborne C2 platforms, and the surface force air defense fire direction centers. As a minimum, the following is required:

1. Designate RADC/SADCs as required and incorporate into the IADS architecture.

2. Specify required data links between C2 nodes and forces.

3. Designate primary and secondary C2 centers for all active air and missile defense forces.

4. Align control centers with their operational forces whenever possible; (e.g., the JFMCC air operations center or the MARFOR TAOC should control all airspace over the MARFOR in the littoral area).

5. Establish an intelligence and warning architecture; ensure remote units and separate forces are addressed.

6. Delegate necessary authorities and establish conditions for automatic permissions, transfers of function, or other means to ensure defenses remain responsive.

7. Determine level of control (engagement authority). This describes the air defense echelon at which positive control of the air battle is being conducted. It can be the AADC, RADC, SADC, ADA battalion fire direction center, or the individual fire unit. Engagement authority, originating with the JFC and normally delegated to the AADC, may be delegated to the RADC/SADC to allow for decentralized execution. Further delegation of engagement authority depends on operational necessity and ROE for DCA operations. The AD element with engagement authority possesses positive control. Engagement authority may be established at different levels for fixed-wing aircraft, rotary-wing aircraft, UASs and TMs, and the levels of control may change over the course of an operation. Engagement authority is delegated to the lowest level SHORAD fire units. High-to-medium altitude SAM fire units normally have engagement authority for TBM engagements. Engagement authority for enemy aircraft normally is at SADC or higher.

8. Determine modes of control. For surface-based air defense the two modes of control are centralized or decentralized. The mode of control will depend upon the capabilities of the C2 systems being employed and both the friendly and enemy air situations. **Centralized control** is when a higher echelon must authorize target engagements by fire units. Permission to engage each track must be requested by the fire unit from that higher echelon. Centralized control is used to minimize the likelihood of engaging friendly aircraft while permitting engagements of hostile aircraft and missiles only when specific orders are issued to initiate the engagement. Normally, centralized control is used for engaging aircraft. **Decentralized control** is the mode of control used when a higher echelon monitors unit actions, making direct target assignments on a management by exception basis to units only when necessary to ensure proper fire distribution, to prevent engagement of friendly air platforms, and to prevent simultaneous engagements of hostile air targets. Decentralized control is used to increase the likelihood that a hostile aircraft or missile will be engaged as soon as it comes within range of a given weapon. Normally, engagements are decentralized only within a SHORADEZ. Surface-based air defense

forces (including SHORAD units) will comply with established ROE and WCS as directed by the designated AD commander for their operational area.

9. Specify trigger events, when they should be changed, and who has the authority to change them, such as **autonomous operations** when a firing unit has lost both voice and data link (i.e., all communications) to higher tactical headquarters. The firing unit commander assumes full responsibility for control of weapons and engagement of hostile targets in accordance with existing ROE, WCS, and previously received directives.

(f) **Establish CAP Stations.** One method of employing fighters is the CAP. Fighter aircraft normally perform CAPs during DCA operations. CAP stations usually contain two to four fighter aircraft armed for air-to-air engagements. The following considerations apply when planning a CAP:

1. Assign barrier CAPs for the defense of a broad area when protecting multiple assets.

2. Assign a CAP to a specific asset (e.g., high value **surface** or airborne asset).

3. Assign CAPs to special missions, as appropriate. For example, a barrier CAP may be tasked to inspect or "sanitize" returning strike packages to ensure enemy aircraft do not shadow friendly aircraft back to friendly areas/bases.

4. If made available for tasking for DCA, consider NAVFOR CAPs as not only defending carrier and amphibious groups, but also for collateral defense of land-based assets by positioning them over land during littoral operations.

5. Consider employing a CAP if defense is still required and combat losses result in gaps in SAM coverage in MEZs.

(g) **Establish a FEZ.** Establish a FEZ to support CAP operations after the surface MEZs are established.

1. The FEZ normally extends above the coordinating altitude to the upper limit of either the assigned DCA or primary threat aircraft operating envelope.

2. Where a MEZ and FEZ overlap horizontally, they may be separated vertically.

3. Fighters are normally given a larger WEZ to perform an area defense mission and to accommodate their longer-ranged weapons system capabilities.

(h) **Position Airborne C2 Stations**

1. Station assets within ranges to perform their C2 function but where threats are minimal and assets cannot be easily engaged and destroyed.

2. Plan to dedicate fighter escort or CAP protection.

(i) **Determine Airborne C2 Coverage and Fire Control.** When planning coverage and fire control, consider the following:

1. DCA fighter aircraft are normally under positive control of a C2 element. Fighters may conduct intercepts autonomously when authorized.

2. With a lack of C2 aircraft or the distance of operations precludes positive tactical control, C2 agencies may provide broadcast information of target data.

3. US fighter aircraft usually operate with enhanced fire control radar and beyond visual range weapons that allow simultaneous engagements of multiple targets.

4. Fighters normally are in communication with a C2 element that vectors them toward airborne targets. The C2 element also provides a communications link between the JAOC combat operations division and the airborne fighters. This communication link provides a flexible and reactive C2 arrangement.

5. Dependent upon the situation and ROE, airborne C2 elements may have the capability to retask fighters to meet protection requirements.

(j) **Establish a JEZ.** The JEZ only is appropriate or possible when the JFC/JFACC/AADC has a high level of confidence in the CTP and positive control and separation that will prevent SAMs from targeting friendly fighters before and after launch. Dependent upon the operational situation and ROE, a JEZ may be employed when one or more of the following factors exist:

1. The enemy's employment of low altitude CMs dictates the need to ensure the ability to engage with all available forces throughout the zone, accepting risk to friendly aircraft.

2. There are significantly more assets that require defense than there are forces to defend them.

3. The operational characteristics of friendly aircraft and surface-based missile systems and the nature of the operation do not lend themselves to establishing a separate MEZ/FEZ.

4. The AADC and subordinate commanders (e.g., RADC/SADC) are confident that there is sufficient situational awareness and established CID procedures to reduce the possibility of fratricide.

8. Missile Defense Planning

a. The geographic CCDRs should locate, identify, and assess potential TM and long-range BM threats. To facilitate JFC operation/campaign planning, and specifically missile defense planning, those CCDRs should produce target folders for potential missile threats. Those target folders should be available for a subordinate JFC to complete and use when necessary, including for preemptive strikes. For the joint force, the Commander, AAMDC, and staff are acknowledged subject matter experts regarding the TM threat. They can support OCA planners to help eliminate the threat and DCA planners to defend against it. For planning to counter the emerging long-range missile threat across-AORs (e.g., intercontinental ballistic missiles) USSTRATCOM JFCC-IMD has the subject matter expertise.

b. **General Planning Considerations.** Missile defense planning adds a unique aspect to the development of the AADP and to planning DCA operations. While plans for both air and missile defenses are integrated in the AADP, the missile threat normally is more difficult to counter. Generally, TMs do not require as much infrastructure and support as an air force; thus, they have a reduced footprint and signature for being targeted. Mobility, dispersal, and concealment further complicate the offensive targeting process against enemy TMs so the primary tactic of destroying/negating the missile threats prior to their launch can be difficult. Once launched, some TMs often are difficult to detect and track for the purpose of engagement. The same 10 planning factors listed for air defense planning must also be considered for missile defense planning (see paragraph 7a).

c. **Active Missile Defense Design.** Missile defense forces are integrated into the joint force as DCA assets against both air and missile threats. Based on an expected TBM threat, the challenge for the AADC could be an economy of force issue: use premier ARFOR SAMs that are capable of active missile and air defense only for missile defense, while using purely air defense assets for defending against enemy aircraft and air-breathing missiles (i.e., CMs). For example, against a formidable TBM threat that could not be eliminated by OCA operations, the AADC may use the premier SAMs only against TBMs, not against air threats, and increase reliance on fighter escorts and CAPs in a layered defense against air threats. A significant missile threat will have great impact on the AADP (i.e., the DAL, placement of WEZs and types of defensive coverages). Flexibility will be required because DCA planners should anticipate there will not be enough resources to defend all assets. Options that provide risk analysis will be required.

(1) The tasks of determining the surveillance coverage areas and planning the MEZs, FEZs, and JEZs, etc., would all be accomplished based on balancing the threat against the active AMDs.

(2) TMs are a significant, but somewhat different threat for the NAVFOR than for the ARFOR/MARFOR/AFFOR. BMs are more of a threat to land-based forces (ARFOR, MARFOR, and AFFOR) than to the sea-based forces because the NAVFOR generally is a "continuously moving MEZ." The more likely and significant threats to the NAVFOR are antiship-CMs from sea-based launchers or land-based aircraft and ASMs from aircraft. The NAVFOR, with both organic fixed-wing

and Aegis-equipped assets, are trained in operating the equivalent of a JEZ, with a layered defense in depth. The AADC should ensure the AADP provides necessary AMD coverage between adjacent land and maritime AD regions/sectors and ensures robust coordination between land- and sea-based RADCs/SADCs to ensure the enemy doesn't find a seam in the air and missile defenses. The NAVFOR may have to provide missile defense for the MARFOR/ARFOR for an amphibious operation. Typically the ARFOR provides active missile defense for all land-based forces, particularly against TBMs.

SECTION B. DEFENSIVE COUNTERAIR OPERATIONS

"All warfare is based on deception."

Sun Tzu, The Art of War
c. 500 BC

The AADC develops the AADP in coordination with the joint force components, integrating DCA operations throughout the theater/JOA (see Figure V-1). The AADP reflects the JFC's objectives, priorities, and the need for air superiority, and the appropriate component commanders provide the surface-, air-, and sea-based forces/capabilities for those DCA operations required to execute that plan.

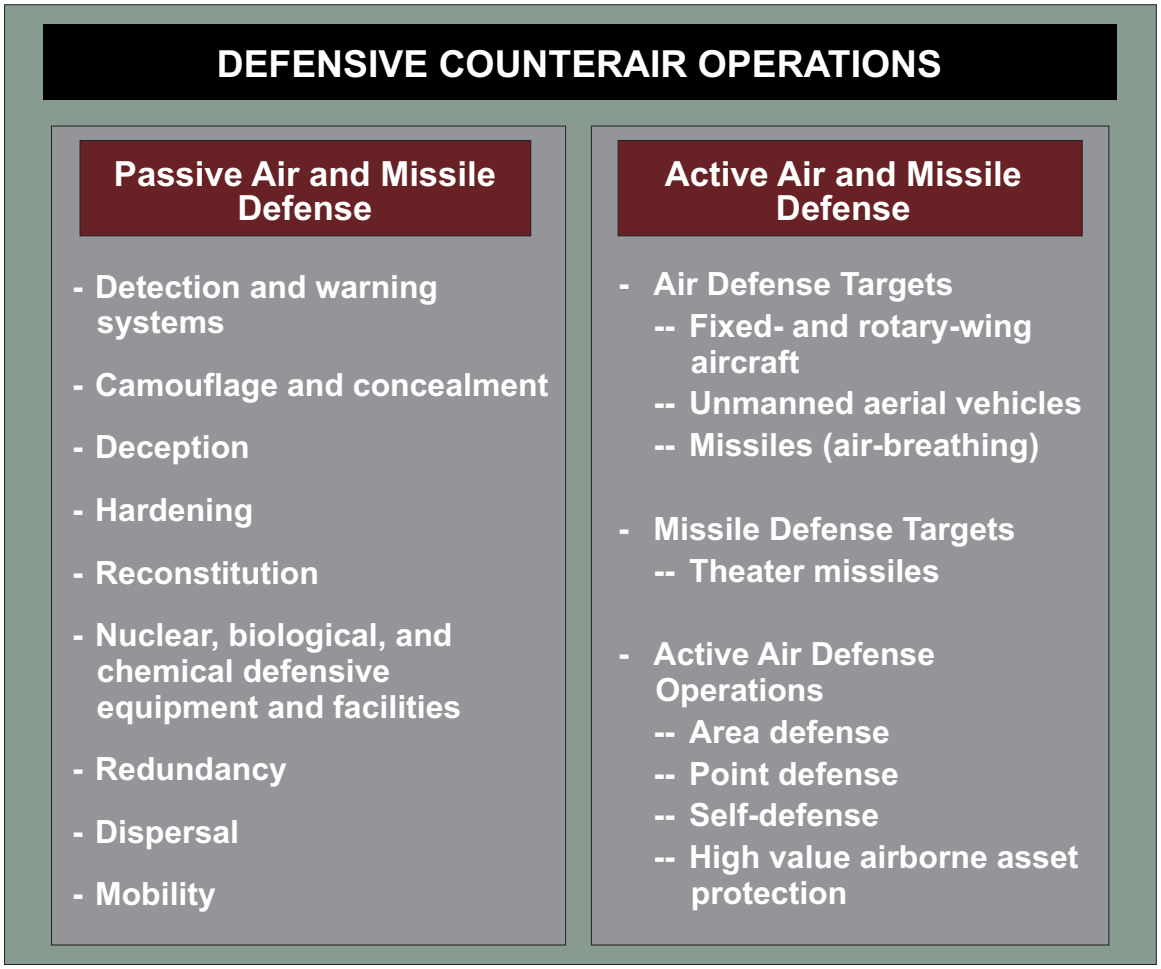


Figure V-1. Defensive Counterair Operations

9. Passive Air Defense

a. Passive air defense provides individual and collective protection for friendly forces and critical assets and is the responsibility of every commander in the joint force. It includes measures, other than active air defense, taken to minimize the effectiveness of attacking aircraft and missiles.

(1) The AADC is responsible for timely warning of attack, which initiates some of the passive defense measures. Warnings may be either general or specific. General warnings indicate that attacks are imminent or have occurred, while specific warnings signify that only certain units or areas are in danger of attack.

(2) Passive measures do not involve the employment of weapons, but they do improve survivability. Depending on the situation and time available, a variety of measures may be taken to improve the defensive posture of friendly forces and assets. Some measures should be planned and practiced during peacetime. **Those assets not assigned adequate active defense assets must rely on passive defense measures for protection**.

(3) The likelihood and timing of an attack may be estimated by analyzing the expected enemy COA, targeting process, and offensive air and missile capabilities (including munitions characteristics and quantities).

b. **Considerations and Measures.** When planning passive air defense, the following are four principal considerations and the passive air defense measures they incorporate:

(1) **Detection and Warning Systems and Procedures.** Timely detection and warning of air and missile threats provide reaction time for friendly forces to seek shelter or take appropriate action. Reliable and redundant connectivity for communications and sensor systems is vital for accurate and timely warning. A combination of air-, space-, and surface-based detection and communication assets should be established to maximize detection and warning. **Warning methods and procedures must be established, disseminated, and rehearsed down to the unit level to be effective.** "All clear" procedures should also be established to notify forces when a warning is false or the threat no longer exists.

(2) **Reduction of Enemy Targeting Effectiveness.** Certain measures may be taken to reduce the effectiveness of enemy targeting and attacks, to include mobility, deception, and OPSEC.

(a) **Mobility.** Mobility reduces vulnerability and increases survivability by complicating enemy surveillance and reconnaissance efforts to pinpoint locations of targets. Mobility may be coupled with concealment to "hide" assets.

(b) **Deception.** Deception misleads adversaries by manipulating, distorting, or falsifying friendly actions. Deception may be used to cause an enemy to waste munitions on false targets, deceive their combat assessment process, and falsely influence their decisionmakers by feeding their intelligence

collectors what appears to be credible information. Deception may deny the enemy the ability to gain correct tactical, operational, and strategic information when using their reconnaissance and surveillance systems.

(c) **OPSEC**

1. **Emission Control/Communications Security.** Communications security and an emission control program for infrared, electromagnetic, and acoustic signature reduction can deny the enemy sensor and reconnaissance assets timely acquisition and identification of friendly target systems (e.g., C2 nodes).

2. **Unit Security/Counter-Surveillance.** Local unit security is an important element in denying accurate targeting data to enemy SOF or other enemy agents. Patrolling and ground forces support is important to keep enemy threat forces of Level I (agents, saboteurs and terrorists) and II (small tactical units) from conducting harassment or interdiction attacks against DCA assets.

3. **Nighttime Support Operations.** Consider nighttime for conducting time-consuming resupply or other operations that could highlight units visibility and increase their vulnerability.

4. **Camouflage and Concealment.** Practice visual signature reduction measures that can "hide" or deny accuracy in locating friendly targets/target systems. These measures may be conducted continuously or in response to specific warnings. Timely intelligence concerning the over flight by enemy satellite and aircraft collection systems is important to the effort. Those measures also may be coupled with deception measures to further complicate chances of effective enemy attacks. The deployment of obscurants can negate the effectiveness and accuracy of attack threats during defensive counterair operations.

Refer to JP 3-13.3, Operations Security*, for additional discussion regarding OPSEC.*

Refer to JP 3-13.4, Military Deception*, for more details regarding deception operations.*

(3) **Reducing Vulnerability.** There are four measures that may enable friendly assets to survive enemy attacks by reducing their vulnerability.

(a) **Hardening.** Valuable assets and their shelters are hardened to protect against physical attack, electromagnetic pulse (EMP), and transient radiation. Hardening measures should be accomplished during peacetime whenever possible. Hardening reduces the effect of attack on systems and facilities (i.e., aircraft, missiles, air base support equipment and facilities, nuclear delivery systems, nuclear storage areas, C2 facilities, communications nodes, and logistic facilities). When EMP hardening is not feasible, and EMP vulnerability assessment should be made to identify suitable preparatory and defensive measures.

(b) **Redundancy.** A principal means of preserving combat power is duplication of critical nodes, capabilities, and systems that are particularly vulnerable to air and missile attack and for which other passive measures may be less appropriate. Redundancy includes dual, contingency, or backup capabilities that can assume primary mission functions (in whole or in part) upon failure or degradation of the primary system. Of primary concern are "soft" targets such as C2 nodes and sensors (antenna) and fixed sites such as airfields and ground stations for airborne sensors.

(c) **Dispersal.** Dispersal reduces target vulnerability by decreasing concentration and making a target system less lucrative. Combined with mobility and deception, dispersal increases enemy uncertainty as to whether a particular location is occupied and, if so, whether it will be occupied when the attack is executed.

(d) **Chemical, Biological, Radiological, and Nuclear (CBRN) Defense Equipment and Facilities.** CBRN defensive equipment and facilities protect against the effects of WMD by providing contamination detection, shelter, and decontamination. Individual protective equipment allows vital functions to continue in the CBRN environment and to minimize effects of WMD attacks.

See JP 3-11, Joint Doctrine for Operations in Nuclear, Biological, and Chemical (NBC) Environments*, for further details regarding protection and operations in a CBRN environment.*

(4) **Recovery and Reconstitution.** Following an air or missile attack, units should be restored to a desired level of combat effectiveness commensurate with mission requirements and available resources. Resources should be made available to restore capabilities in accordance with JFC established priorities. Recovery and reconstitution after a WMD attack will require special emphasis as improper handling of CBRN casualties may hamper other activities.

c. **Resources for Passive Defense.** The components of the joint force bring unique capabilities to the different aspects of passive air defense. Engineers, chemical defense and decontamination experts, explosive ordnance disposal personnel, and medical units may contribute significantly to passive air defense efforts. A threat-based risk analysis, distributing area responsibilities, and establishing support tasks ensures that critical assets have adequate passive air defenses. Some MNF members may specialize in passive defense capabilities for CBRN defense and recovery. HN support and civilian infrastructure may augment or enhance joint force recovery efforts, either through government coordinated action or contracted support. It is essential that these capabilities, when available, are planned and integrated into the total passive air defense response capability.

d. **Execution of Passive Defenses**

(1) **Responsibilities.** The AADC and chain of command is responsible for timely warning of attacks. Component commanders and their forces have delegated responsibilities to ensure passive defense measures are planned and executed in a timely manner down to the unit level.

(a) As a minimum, the AADC must be able to pass warnings directly to the joint force Service and functional component commands, and if applicable, establish procedures to pass warnings to and from HN authorities. BM warnings generally will originate from the theater event system/joint tactical ground station detachment. Airborne threat warnings generally are issued through the C2 system (e.g., RADC/SADC). Local commanders may declare local ADW based on the local threat.

(b) Component commanders must ensure communications links are established down to the lowest unit level.

(c) Cross-component support is a unit and component commanders' responsibility. Cross-component support may establish connectivity to geographically isolated units of other Services or MNF units that are unable to link within their parent organizations.

(2) **Defense Clustering.** To facilitate the span of control for local commanders, support activities may be grouped into clusters. Grouping defended assets with active DCA units or locating critical force elements near declared assets enables economy of force for protection and may enhance localized defense in depth. Clustering also may enhance the availability and contributions of HN assets. In the early stages of force projection, grouping allows any one location to draw upon the resources of the group.

10. Passive Missile Defense

The considerations and measures for passive missile defense are the same as they are for passive air defense with one exception. Within the theater/JOA, the detection of enemy air threats and warning/cueing for air defense measures are provided by the JFC's DCA assets. The JFC/AADC controls the surface- and air-based radars/sensors that detect and track the enemy air threats and the C2 systems that disseminate those warnings. For passive missile defense, national assets under the control of CDRUSSTRATCOM normally detect the launches of BMs, predict the impact points, and communicate warnings to the applicable JFC in the theater/JOA. The JFC, in turn, ensures that the tactical warnings are disseminated throughout the theater/JOA. The AADC normally does not have tracking data on a BM warning until the missile comes within range of the missile defense radars.

11. Active Air Defense

a. Active air defense involves direct defensive action taken to destroy, nullify, or reduce the effectiveness of hostile air and missile threats against friendly forces and assets. DCA operations are conducted in accordance with the AADP (integrated with the ACP), including those authorities for decisions based on the current ROE. Rapid, reliable, and secure means of ID and CID within the airspace control area facilitates the engagement decisions that may be critical to the survival of friendly forces. Integration of airspace control and air-to-air and surface-to-air weapons for engagements is facilitated by establishing WEZs (HIMEZs, LOMEZs, SHORADEZs, FEZs, or JEZs).

Active air defense assets include fixed- and rotary-wing aircraft.

b. Execution of DCA operations requires continuous surveillance of the theater/JOA. Integration and connectivity of sensors should provide a complete, reliable, and timely COP for decisionmaking. The track production (including ID) follows a sequential process with dissemination of track data as rapidly as possible. That detailed track data permits C2 nodes to evaluate tracks and determine their significance. Tactical warnings trigger some passive defense measures and cue active defense assets for action. Active defense forces then engage hostile tracks or allow passage of friendly tracks. Through effective battle management the positively identified threats are engaged by the optimum system available.

c. The AADC controls the battle using approved authorities (e.g., engagement) and the flexibility of the IADS. To decentralize execution, the AADC normally will delegate some or all AADC authorities down to the RADC/SADC level (if established). The AADC must specify the conditions and limits within which engagement authority is decentralized. Based upon the threat level and the complexity of engagements, a control node should retain engagement authority if it can adequately perform battle management. For air battle management, the AADC or a RADC/SADC uses three tools for which the authorities may be delegated further down to the tactical level: ADW, WCS, and fire control orders.

(1) **Air Defense Warning Conditions (ADWCs).** An air defense warning is issued as an ADWC. The ADWC is a degree of air attack probability based on the threat assessment. The AADC establishes the baseline ADWC for the joint force, which may be different for air-breathing threats than for BMs. Subordinate air defense commanders may issue higher but not lower ADWCs for their areas. ADW are disseminated though joint and components C2 channels to all AMD elements and fire units.

(a) ADWC White - An attack by hostile aircraft or missile is improbable.

(b) ADWC Yellow - An attack by hostile aircraft or missile is probable.

(c) ADWC Red - An attack by hostile aircraft or missile is imminent or in progress.

(2) **Weapons Control Status.** WCS is a control measure designed to establish the freedom for fighters and surface air defense weapons (including small arms weapons) to engage threats. Normally, any unit directly threatened by a missile of any type, friend or foe, may engage it. The AADC establishes the WCS for the joint force and the WCS may be different for air-breathing threats than for BMs. This authority originates with the AADC and can be delegated to subordinate commanders. **Different WCSs may be applied simultaneously to different weapons systems and in different airspace areas.** US forces use three standard WCSs that may be declared for a particular area and time. US forces do not disseminate these WCS orders via TDL. The WCSs are "free, tight, and hold."

(a) Weapons Free - The least restrictive status; when any target not positively identified in accordance with current ROE as friendly may be engaged.

(b) Weapons Tight - The normal status. Units may only fire on targets identified as hostile in accordance with current ROE.

Note: Weapons free and weapons tight control orders impose a status or condition applicable to weapons systems within a defined volume of airspace.

(c) Weapons Hold - The most restrictive status. Units may only fire in self-defense or when ordered by proper higher authority.

(3) **Fire Control Orders.** Fire control orders are established to standardize tactical firing instructions issued during the conduct of an air battle. They are given to direct or inhibit firing by surface-to-air weapons units based on the ROE and rapidly changing tactical situations. Based on the ROE, the JFC-approved AADP should establish how fire control orders will be communicated. There are three primary fire control orders.

(a) "Engage" directs or authorizes units and weapon systems to fire on a designated target.

(b) "Cease engagement" or "cease fire" directs units to stop the firing sequence against a designated target; however, units may continue to track and missiles already in flight are permitted to continue to intercept.

(c) "Hold fire" is an emergency order used to stop firing. If technically possible, missiles already in flight must be prevented from intercepting.

d. **Weapon Systems Employment.** Although DCA operations are defensive in nature, they should be conducted as far from friendly areas as feasible. Advanced warnings of hostile air and missile actions is vital for a layered defense. Intercepts as early as possible facilitate

necessary multiple engagements. To ensure attrition of enemy air and missile threats, the engagement process must continue throughout the approach, entry, and departure from the friendly operational area. **The strength of an IADS is the synchronization of the integrated surface-to-air and air-to-air systems in mutual support of defensive coverage for the operational area.**

(1) **Surface-to-Air Weapon Systems.** These weapons include SAMs and AAA and are employed in both area and point defenses — often in self-defense. Their effectiveness requires reliable ID/CID processes, C2 connectivity, and interfaces with airborne systems to preclude engagement of friendly aircraft and unnecessary expenditure of weapons against enemy threats. Surface weapon systems have optimal capabilities against targets at different ranges and altitudes as reflected in their WEZs. In extremely dynamic air defense situations with a multitude of targets, some systems are capable of automatic detection and engagement. Surface-to-air systems operate under fire control orders based on the ROE.

(2) **Air-to-Air Fighter Interception.** Fighter aircraft performing DCA or OCA missions may be tasked to respond to the detection of hostile, potentially hostile, or unknown airborne targets. Aircraft normally operate under positive control of a C2 element but may initiate and conduct intercepts autonomously when authorized (e.g., self-defense or depth of the operation precludes positive control). When close or positive control is not possible, the controlling element may provide general broadcast information on targets to all affected fighters. Air-to-air fighters operating with enhanced fire control radars can engage multiple targets with beyond visual range weapons to defend against hostile targets before they are within threatening range of friendly assets. However, the ROE must allow use of beyond visual range weapons.

(a) Air defense fighter aircraft normally perform CAPs, DCA fighter escort, or respond to airborne threats from ground alert locations. Fighters normally will be under positive control for vectors toward their airborne targets. CAPs include barrier CAPs for area defense and CAPS for base defense or local asset defense. Some CAPs also may have additional missions such as using barrier CAPs to inspect or "sanitize" returning strike packages to ensure enemy aircraft do not shadow "friendlies" back to base. Additionally, DCA fighters may be dedicated to protect HVAAs from airborne threats.

(b) C2 elements also provide a link between the JAOC combat operations division and the fighters. This communication link provides a flexible and reactive C2 arrangement for retasking flights to meet dynamic DCA operational requirements or to support OCA operations.

(c) NAVFOR CAPs defending carrier, amphibious, and expeditionary battle groups may be positioned over land during littoral operations and can provide collateral defense of the land AO.

e. **Other Employment Considerations**

(1) **Movement and Mobility.** US surface-based air defenses are moveable or mobile. When operations require ARFOR and MARFOR firing units to change location, displacement times must be considered. Dependent upon the weapon system and situation, these surface unit

displacements may take hours or days. Extensive coordination may be required for convoy plans, permissions, protection, realignment of logistics, travel time, and shifting of backfill forces may be necessary. NAVFOR surface forces are capable of full operations while repositioning.

(2) **Cross-boundary Operations.** Boundaries between sectors and between forces and units are areas of risk. Procedures for distribution and control of fires between sectors and units should be addressed during planning. To minimize the risk of fratricide while providing a seamless defense, coordination must be rehearsed, not just planned. When engagements cross a unit boundary or are in a buffer zone, priority of fires normally will be given to the threatened unit.

(3) **Alert Posture.** Levels of readiness should be tailored to the level of threat and warning. Crews and systems cannot be maintained at high levels of alert status indefinitely. Unless forces are actively conducting engagements or redeploying, some portion should be engaged in crew rest and/or maintenance. "All clear" procedures should be established when a threat no longer exists.

(4) **Transfer of Authority and Transitions in DCA Operations**

(a) Transfers of C2 functions such as airspace control, battle management authorities, etc., from one level of command or controlling element to another, must be accomplished smoothly, with the succeeding element not assuming C2 functions until the appropriate level of capability is actually in place — and rehearsed, if possible. Prior to hostilities, if possible, redundant or secondary C2 nodes should rehearse primary C2 functions.

(b) Temporary transfers of authority (e.g., ID or engagement authority) must be acknowledged by establishing and receiving elements and acknowledged by their subordinates. For example, if an AWACS is given a SADC function from a CRC, their subordinate air and surface fire control units, as well as the AWACS, must acknowledge the transfer. When the CRC regains that function, the AWACS and subordinates must again acknowledge the transfer. In all cases the next higher C2 node also must be notified and acknowledge the changes. Experience shows this has been a problem.

(c) Detection of enemy offensive preparations may be an indication or warning of an impending hostile act and signal a decision for transition from peace to combat operations. Detection of these preparations allows for the transmission of tactical warnings that alert commanders, automated weapon systems, sensors, fusion centers, C2 nodes, and, in some cases civil authorities, to anticipate the attack.

12. Active Missile Defense

a. Under the counterair framework, active missile defense is integrated with active air defense as a DCA operation. Generally, the same weapons used for missile defense are capable of air defense. Certain ARFOR and NAVFOR SAM systems are specifically capable against

TBMs as well as air-breathing threats (aircraft and CMs). **The important factors are the enemy threat and the conservation of missile defense forces to ensure that unique capability is not exhausted when alternative air defense strategies and tactics could be used against air-breathing threats.** In some situations, the air-breathing threat to a high priority asset on the DAL may require the battle manager to use a missile defense capable SAM.

b. Theater active missile defense systems are primarily SAM systems and their supporting infrastructure. Although TBM launches are detected and warnings are sent to the JFC with the predicted impact point, engagements are only possible once missile defense radars detect them. Other TMs such as CMs and ASMs present the same problem—they must be detected to be engaged. To conserve missile defense SAMs, air defense assets should be used to counter the enemy aircraft that normally carry ASMs before they are in threatening range. CMs, air-breathing threats but often difficult to detect, must be detected and tracked for interception.

(1) Missile defenses are included in the WEZs (e.g., HIMEZs and LOMEZs).

(2) Missile attacks are included in the ADW and separate ADWCs may be established for both TBMs and air-breathing threats.

(3) WCSs are established and may be separate for responding to both air-breathing and TBM targets.

(4) Fire control orders include both AMDs.

Successful active air and missile defenses require integration of all appropriate defensive forces and weapon systems within the theater/joint operations area.

c. Once CMs and TMs are detected, JFC ROE normally should allow engagement of CMs and TBMs based on their unique target profiles, their potential warheads and their threat to friendly assets, and the quick reaction necessary for success. When to use missile defense assets is an essential battle management employment decision.

d. **The best missile defense strategy continues to be the success of offensive operations in countering air and missile threats.**

APPENDIX A
COMBAT IDENTIFICATION

1. General

CID is defined as the process of attaining an accurate characterization of detected objects in the operational environment sufficient to support an engagement decision. In counterair operations, CID should be accomplished with near real time or better exchange of information between airspace control/air defense units and airspace users to meet the time and accuracy demands of combat operations. CID is essential to prevent fratricide in dynamic counterair operations and to ensure economy of force. Effective CID enhances joint force capabilities by providing confidence in the accuracy of counterair engagement decisions throughout the force. **While CID is a process for all joint forces in both defensive and offensive operations, the focus in this appendix is on application of CID in counterair.**

2. Objective

The objective of CID for AMD is to maximize effectiveness by providing high confidence ID (friend or foe) of a potential target so an engagement decision can be made in accordance with the ROE. The CID process complements the ID process, which is used for air defense tracking and airspace control.

3. Considerations for Conducting Combat Identification

a. CID provides a process that allows an engagement decision based on the JFC's chosen balance between the confidence level of ID and the risk of fratricide or mistaking an enemy as friendly, all framed within the operational situation and supported by the ROE.

b. While the CID process uses some of the same systems and information used for the basic ID process, there are ID systems specifically designed for the higher confidence, positive ID that is more suitable for the purpose of CID. Some ID systems have an autonomous identification capability, with data links and digital information exchanges (including real time imagery of targets/target areas) that greatly enhance their ability to perform more effective CID (e.g., blue force tracker).

c. ID information may be obtained from onboard or external surface-, air-, and space-based systems (e.g., radars, IFF systems, and selective ID features) and through established processes and procedures approved by the JFC. An effective C2 system (including reliable voice and data networks) is required to gather, assimilate, assess, and distribute this information from a myriad of sources and nodes.

d. Planning and executing the CID process requires thorough knowledge of the joint force scheme of maneuver, OPLANs, and ACMs documented in the ACP, AADP, and ACO. To avoid a single point of failure, normally no one C2 node acts as an exclusive conduit of all CID

information. Optimally, all C2 nodes would have all CID information applicable to their operational area.

e. Electronic methods provide the earliest and most reliable means of positive ID. Positive visual ID may be required by the ROE in some scenarios, but may not be practical in others due to time and distances or consideration of an enemy's beyond-visual-range weapons capabilities. For example, due to their unique flight profiles, ROE normally allow TBMs and CMs to be engaged immediately — the approved ROE being the controlling factor. It is important that ROE allow for the most advantageous means of ID. While airspace control can function with an effective combination of different methods of ID, air defense engagements (with few exceptions) require positive ID (e.g., visual observation or electronic ID). For example, for SEAD operations, correct identification of all friendly electromagnetic signal emitters is important to prevent erroneous suppression (destruction or disruption) of friendly force electronic systems. Experience has shown that some friendly forces' electronic emitters are not properly identified to the SEAD forces. Those spurious emitters may be read as "unknown" or "hostile" by a SEAD aircrew, and dependent upon the ROE and intensity of the situation, that emitter may be engaged, perhaps in self-defense, unless positive ID is accomplished. If that friendly force with a spurious emitter could be positively identified by secure electronic means (i.e., CID), it would probably not be engaged in that context.

f. In the absence of positive ID, procedural ID may be used based on ROE and the commander's decision to accept the potential increased risks of fratricide or misidentification of enemy as friend. For example, when a surface air defense unit becomes autonomous and procedurally reverts to a self-defense mode, the threat of fratricide may increase because that unit would be more likely to engage friendly aircraft that fly toward the unit. Procedural ID methods using airspeed, altitude, and planned flight corridors as parameters may mitigate the perceived threat to the AD unit. ROE and WCS may also be so restrictive that to fire in self-defense would be prohibited without an unknown first firing on the defending unit. The latter, of course, increases the risk for the AD unit.

g. ROE are critical to both the ID and CID processes. ROE directly supports the CID process and should allow for the most advantageous means of identifying a detected object: the CID process identifies friend or foe and ROE determines response. A good example is the ID criteria for TMs, which normally should be different than that for aircraft. Because TBMs have a distinct flight profile, with little warning, and a very short opportunity for intercept, the ROE should allow for advantageous ID and immediate engagement. Experience has shown the ROE for incoming enemy CMs, once detected, also should allow immediate engagement because they are difficult to continuously track.

4. Identification Matrix

a. The AADC should develop a ID matrix to complement the ID process normally used for tracking and to facilitate engagement decisions. Often, track ID on the TDL may be from procedural methods that will not support the ROE criteria for engagement. The TDL will carry that track ID classification (e.g., a hostile ID track) but the engagement authority may require either positive ID, a determination of hostile act/intent, or violation of a procedural ID restriction before an engagement

decision is made. To that end, CID criteria contained in the matrix and in all plans must be coordinated to ensure no conflicts arise during execution of counterair operations.

(1) **ID Matrix Use Versus Implementation of TDL Track ID/Classification.** Track ID/classification data shared over a TDL may not support the CID process. Planners must consider how the IDs are determined and entered into the track ID/classification system (e.g., a TDL) that portray a particular track throughout the C2 systems. The JICO cell planners should provide a list of ID classifications (e.g., unknown, friendly, hostile, neutral) to be used on the TDL.

(a) The ID matrix must take into consideration the limitations inherent in the employed systems that will implement the ID procedures. Once the set of track symbols is determined, the use of terminology for these symbols must be aligned. Each JFC should have ID criteria that includes brevity code terms. For example, pay particular attention to the "bandit" codeword versus the system track symbol for "hostile." An enemy aircraft with a TDL tracking symbol for hostile could be called a "bandit" (ID as enemy not authorized to engage) or called a "hostile" (ID as enemy with authority to engage). The AADC should ensure only those specific voice brevity terms approved by the JFC for authority to engage are used throughout the CID process.

(b) **Build the ID matrix to the lowest common denominator, that is, what everyone can classify/transmit/receive/forward to support the shooter. This will reduce the risk of missed targets and fratricide.**

(2) **ID Criteria.** ID criteria are used for application of ROE. The ROE supports CID criteria for an engagement decision dependent upon weapon systems capabilities. The AADC is responsible for recommending DCA ROE and developing ID and engagement criteria for JFC approval in the AADP, with specific instructions in the ATO and/or SPINS.

(3) **Positive ID methods.**

(a) IFF Modes (1 – 5 per the ATO/SPINS).

(b) PPLI.

(c) A radar contact correlated with an authenticated/secure voice (position) report from an air or ground control agency.

(d) External/onboard CID systems (e.g., blue force tracker or noncooperative target recognition).

(e) Visual ID.

(4) **Positive ID considerations.**

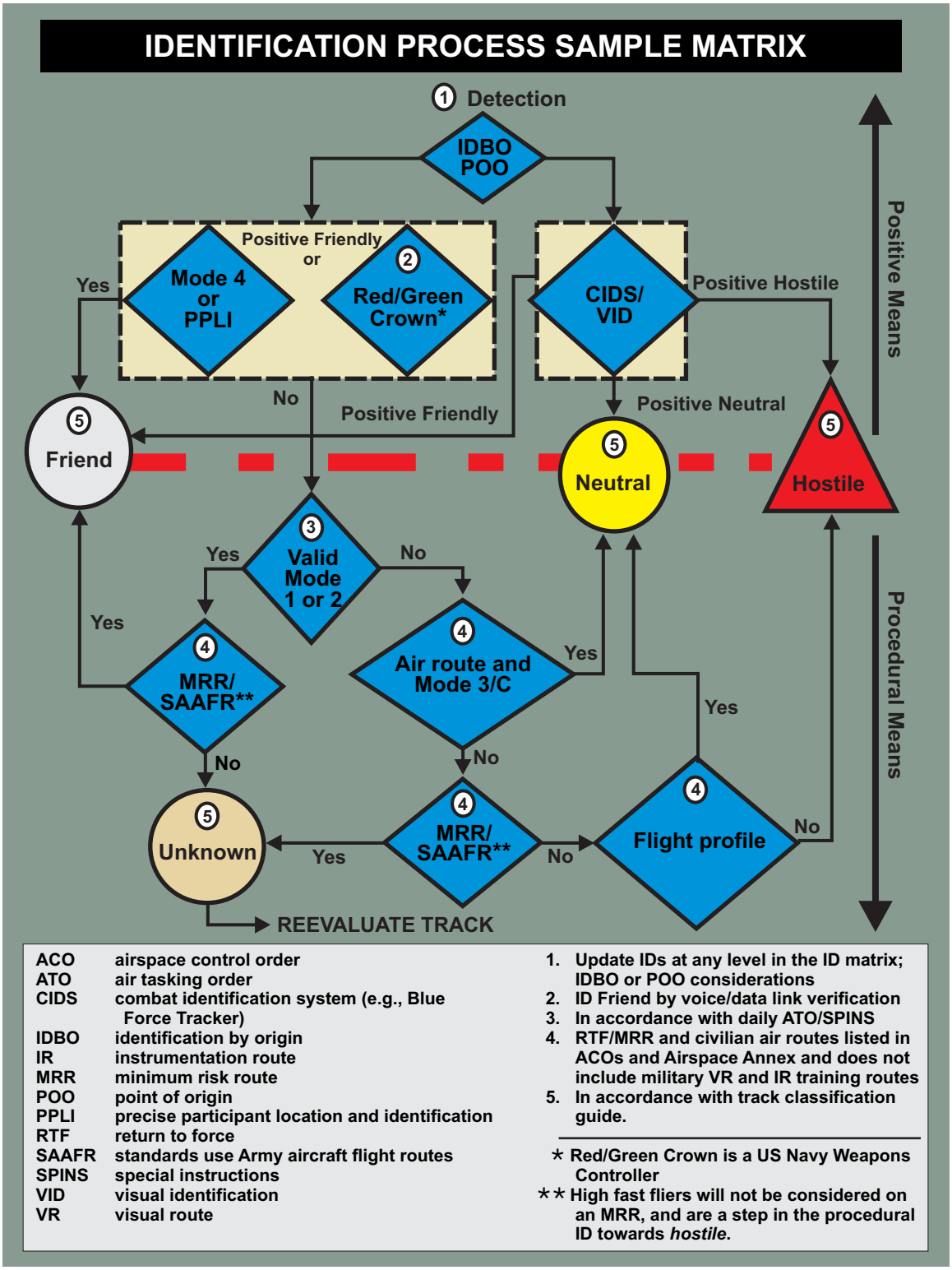
(a) Positive ID is an ID derived from visual observation and/or electronic systems, possibly combined with other factors (e.g., point of origin), with a higher confidence of accuracy than a simple lack of friend or lack of enemy. When available, positive ID is used because it provides the most rapid, reliable, and transferable means of identification. Most enemy positive hostile IDs are derived from technology-based ID systems that exploit the physical or electronic characteristics of a target (e.g., noncooperative target recognition, signals intelligence, or electronic support measures).

(b) Not all CID participants may see the same ID-related information. This is dependent primarily on system implementation, J-series versus M-series message standards, and operator display capabilities. Because of the different implementation of TDL messages, planners should consider limiting the number of track classification symbols to reduce confusion and the potential for fratricide.

Note: Due to the recent NSA decertification of the Mark XII Mode 4 system [DIRNSA message 081811Z Oct 03] ID planners should refer to FM 3 01.61/MCWP 3-25.11/NTTP 6- 02.4/AFTTP(I) 3-2.39, *Multi-Service Tactics, Techniques, and Procedures for Mk XII IFF Mode 4 Security Issues in a Joint Integrated Air Defense System.*

(5) Figure A-1 provides a sample ID matrix for tracks.

For a detailed discussion of CID in an IADS refer to FM 3-01.15/MCRP 3-25E/NTTP 3-01.8/ AFTTP(I) 3-2.31, Multi-Service Tactics, Techniques, and Procedures for an Integrated Air Defense System.



ACO	airspace control order
ATO	air tasking order
CIDS	combat identification system (e.g., Blue Force Tracker)
IDBO	identification by origin
IR	instrumentation route
MRR	minimum risk route
POO	point of origin
PPLI	precise participant location and identification
RTF	return to force
SAAFR	standards use Army aircraft flight routes
SPINS	special instructions
VID	visual identification
VR	visual route

1. Update IDs at any level in the ID matrix; IDBO or POO considerations
2. ID Friend by voice/data link verification
3. In accordance with daily ATO/SPINS
4. RTF/MRR and civilian air routes listed in ACOs and Airspace Annex and does not include military VR and IR training routes
5. In accordance with track classification guide.

* Red/Green Crown is a US Navy Weapons Controller

** High fast fliers will not be considered on an MRR, and are a step in the procedural ID towards *hostile*.

Figure A-1. Identification Process Sample Matrix

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APPENDIX B
AREA AIR DEFENSE PLAN FORMAT

Copy No.
Issuing Headquarters
Place of Issue
Date/Time Group of Signature

AREA AIR DEFENSE PLAN: Operation/Exercise NUMBER OR CODE NAME

References: Maps, charts, and other relevant documents.

TABLE OF CONTENTS

1. Situation. Briefly describe the situation the plan addresses. The related OPLAN or concept plan, as well as any other applicable OPLAN/AADP that may apply, should be identified as appropriate. Include a description of the conditions under which the guidance and procedures in the AADP are applicable (e.g., the exercise, OPLAN, operation order, military operation, coordination between air and ground defense forces).

a. Guidance. Provide a summary of directives, letters of instructions, memorandums, treaties, and strategic plans, including any campaign/OPLANs received from higher authority, that apply to the plan.

b. Enemy Order of Battle. Provide a reference to the intelligence annex of the governing plan and/or a top-level summary of pertinent intelligence data, including information on the following:

(1) Composition, location, disposition, movements, and strengths of major enemy forces that can influence action in the operational area.

(2) Definition of threat axes, DCA operations, known WMD, and estimated enemy COAs.

(3) Known IPOE for the operational area.

(4) Enemy vulnerabilities, COGs, and decisive points.

c. Friendly Order of Battle. State information on friendly forces assigned.

(1) Describe friendly air defense forces, including C2, aircraft (including counterair, reconnaissance, surveillance and support), location of SAM units, and support forces.

(2) Describe missile defense forces, including those with both AMD capabilities.

(3) Describe BM defense system capabilities if any are located within the JOA or can support the JFC.

d. Non-Allied Forces

(1) Describe neutral forces and air defense capabilities in or near the theater that could impact operations. Include general statement and any specific information about COAs and WMD capabilities. Include air and sea routes, shipping lanes, location of SAM units, and ATC information.

(2) Describe noncombatants in or near the theater that could impact operations. Include information on shipping lanes and international air traffic, if known.

2. Mission. State the joint air defense tasks and the purposes and relationships to achieving the AADC's objectives.

3. Air Defense Operations

a. Intent

b. Concept of Operations. Describe the concept of operations, including the mission assumptions, maintenance policies, and JOA within which the AADP applies.

(1) Air defense organization – air defense area, regions, and sectors identified, including boundaries. Air and surface sensors, shooters, and C2.

(2) Provide or reference the list of critical assets to be defended (with asset criticality) with respect to campaign phase and timing within the campaign phase.

(3) Designation of prioritized defended assets with their associated levels of protection as approved by the JFC. May include specific responsibilities of defending commander and allocation of forces.

(4) AMD forces deployed locations overview.

(5) Phases of air defensive operations in relation to the plan.

(6) Timing and duration of phases.

c. Coordinating Instructions

(1) Describe the integrating policy, including the philosophy of the weapons control plan and interfaces between commanders at various levels. Include plans and procedures for employing air control units and missile control units. Also include list of vital areas and target priorities policy and guidance, as well as return to ship/base procedures. Generally describe the

passive air and missile defense warning responsibilities, including MNF and HN notifications, with reference to Appendixes 1 and 3, in Annex C (Operations) of the AADP.

(2) Describe Weapons Coordination Policy and Code Words. Describe preplanned responses to tactical situations, including lost communications, approach of hostile aircraft or low/slow fliers, antiship CM/land attack CM launch/detection, transporter/erector/launcher detection or BM launch, reconnaissance aircraft detection, adverse weather, and detection of TSTs.

(3) ROE

(a) Include ID and CID procedures and requirements and deconfliction procedures.

(b) Describe the ROE's impact and constraints on joint air and missile defense operations.

(4) Describe reporting requirements, including the ATO, SPINS, ACO, TACOPDAT, daily intentions messages, OPTASKLINK, and status reports.

(5) Describe/discuss interaction between AMD operations and procedures and the ACP.

4. Logistics. Give references to where this information is maintained.

5. Command, Control, and Communications

a. Command Relationships. State the planned C2 structure for the entire joint air and missile defense operation. Indicate any transfer of forces contemplated during the air and missile defense operations, including the time of expected transfer. Give locations of all pertinent C2 agency locations and command posts for various commanders.

b. Communications. State where to find the communications plan(s).

c. Command Designators. If certain terms or codewords are an integral part of a Service's DCA lexicon, be sure to define or explain them; for example, the Navy uses "Red Crown" for their airspace control center.

6. AADP Guidance. The AADP is developed in collaboration with the JFC, component commanders, and MNF partners. Although the AADP is designed to be the AADC's plan of action, it is a "living" document. RADC/SADC may wish to provide supplements to the plan to reflect additional guidance or intentions. While the AADP includes topics for discussion, it may be written to reflect greater or lesser detail and may serve as a reference document to point users to other more detailed messages like the TACOPDAT, OPTASKLINK, SPINS, ATO/ACO, etc.

(Signed) (Commander — AADC)

ANNEXES: (List of notional AADP annexes, appendices, and tabs.)
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Annex C: Operations
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  - Tab B: JFACC Tier II Voice Early Warning
  - Tab C: JFLCC Tier II Voice Early Warning
  - Tab D: JFMCC Tier II Voice Early Warning
- Appendix 2: Combat Air Patrol Management and Control
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Annex D through Annex I: Not used.
Annex J: Air Defense Command Relationships.
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Annex K: Command, Control, Communications, and Computer Systems
- Appendix 1: JRE and C2 Voice Connectivity
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Annex M through Annex Y: Not used.
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SECURITY CLASSIFICATION

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APPENDIX C
DEFENSIVE COUNTERAIR ESTIMATE FORMAT

DCA ESTIMATE OF THE SITUATION

(Classification)

Headquarters
Place
Date, time, and zone
Message reference number

DCA ESTIMATE NUMBER ____

References: Maps, charts, or other documents.

Time Zone Used Through the Estimate:

1. MISSION

Clearly state the task given to the AADC by the JFC and the purpose for the task. The task should describe what friendly DCA forces will do to the enemy. The purpose describes the reason for the task and should remain effective even after the task becomes outdated due to a change in the situation.

2. SITUATION AND CONSIDERATIONS

This paragraph describes the conditions under which the unit will perform its mission and the possible COAs of the supported force.

a. Characteristics of the operational area. For this paragraph, determine those factors that influence friendly and enemy actions and that may influence the choice of a COA. In the absence of facts, use logical assumptions that might directly affect the mission. Include an analysis of the effects of conducting DCA operations.

(1) Weather. Put the analysis of data from predicted weather, atmospheric conditions, and solar/lunar data for the period in this paragraph. Climatological data also should be investigated when completing this paragraph. Assess how the weather influences friendly and enemy operations. For enemy operations include an evaluation of how current and forecast weather and solar/lunar data impacts enemy use of UASs; missiles; aircraft (fixed- and rotary-wing); and airborne or air assault operations. Try to determine or predict when the enemy is most likely to use those assets due to the weather.

(2) Terrain. Analyze the effects of terrain, including effects on observation and fire; cover and concealment; movement (surface and air); employment of friendly and enemy WMD;

communications, EW, and combat surveillance; unconventional warfare; psychological operations; and other aspects of military operations. Determine key terrain and air avenues of approach. Also discuss terrain features that limit air vehicle detection or target acquisition and terrain that might canalize or force air targets to fly a particular profile. Try to determine where the enemy will most probably use air assets.

(3) Other pertinent factors. List analysis of political, economic, sociological, psychological, and other factors (such as hydrographics, environment, communications, science, technology, materiel, transportations, safety and accident prevention, and manpower). Include deduction about their effects on friendly and enemy operations.

b. Enemy Air and Missile Forces

(1) Disposition. List locations of enemy air and missile forces that could participate in operations. Determine combinations of air platforms that the enemy may use when conducting a particular type of operation.

(2) Composition. How the enemy organizes for combat. Includes identity of units, types of air platforms and missiles, and armament. Also address the expected number of sorties and missiles flown per day and possible composition of those sorties.

(3) Strength. Numbers and sizes of committed and reinforcing units. Consider the enemy's location, doctrine, and mission. Identify air and missile assets and air support units that could or may affect the operations. When, where, and how many air platforms will the enemy fly during this operation?

(4) Other considerations. Enemy forces not discussed above.

(5) Recent and present significant activities. Summarize recent enemy activities that were both successful and unsuccessful. Highlight any enemy air activity, to include number, type of air platforms, and locations.

(6) Peculiarities and weaknesses. Indicate enemy peculiarities and weaknesses that might influence combat effectiveness, including vulnerability to deception.

(7) Courses of Action. Identify available information from which to determine possible enemy COAs and their relation to the enemy's joint COA.

c. Friendly Forces. Identify disposition, composition, and strength. Highlight the vulnerability of the joint force to enemy air and missile attacks and surveillance.

(1) Friendly COAs. State the JFC's COA. Include any guidance that affects DCA operations. Include description of any phasing of operations in the COA and the impact of those operations on support relationships or requirements.

(2) Current status of resources within theater/JOA. Identify the status of personnel and logistics in the unit. Identify civil-military operations requirements. Identify limitations that affect or may affect the conduct of DCA operations. Can the mission be accomplished?

(3) Current status of other DCA resources that affect theater/JOA.

(4) Comparison of DCA requirements versus capabilities and recommended solutions.

(5) Key considerations (evaluation criteria) for COA supportability.

d. Assumptions. State the assumptions relevant to the situation, mission, forces, capabilities, threat, etc., that will affect the commanders' decisions.

3. ANALYSIS

Analyze each COA using evaluation criteria. Identify those aspects in the JFC's plan that create difficulty in providing DCA coverage and affect the ability of the force to accomplish its mission.

4. COMPARISON

a. Compare COAs using evaluation criteria. Rank order COAs for each key consideration. A decision matrix should visually support comparison. Present a DCA COA for each JFC COA.

b. Each COA should include the following aspects:

(1) DCA mission.

(2) DCA priorities.

(3) DCA fires.

(4) DCA scheme of maneuver.

(5) Task organization.

(6) Command and support relationships.

(7) Key passive defense measures.

5. RECOMMENDATIONS AND CONCLUSIONS

a. Recommended COA based on the comparison.

(1) Indicate which joint COA(s) DCA can best support (using the elements of who, what, where, when, how, and why).

(2) Recommend list of DCA priorities.

(3) State the recommended DCA organization for combat, and employment of other active DCA assets.

(4) Possible OCA targets.

(5) Passive and active DCA measures that will be most effective.

(6) Issues, deficiencies, and risks with recommendations to reduce their impacts.

b. Conclusions.

ANNEXES: (as required)

APPENDIX D
THEATER MISSILE SYSTEMS

1. Background

a. TMs are defined as TBMs, CMs, and ASMs (not including short-range, nonnuclear, direct fire missiles, bombs or rockets such as Maverick or wire-guided missiles). Their targets are within a given theater of operations. TMs have unique capabilities that must be considered when planning countermeasures. For example, no other target system can put a warhead into the theater JSA or threaten friendly population centers and neutral countries in a matter of minutes. Other target systems do not create public panic and a political situation each time a launch is broadcasted on television worldwide by reporters wearing gas masks. To effectively counter the threat, these unique traits, coupled with the somewhat elusive nature of some TM target systems, require the dedicated attention of determined, knowledgeable professionals.

b. Modern. Modern TMs have very long ranges and can deliver a variety of warheads, including high explosives and WMD. They are also currently difficult to counter. Because they are relatively cost-effective weapons, TBMs are weapons of choice for many developing nations. Such weapons provide an offensive capability and, when mated with a WMD, give a nation the ability to deter a potential adversary by holding population centers and/or military forces at risk. Rogue nations believe TMs provide them with a counter to sophisticated land, air, and naval forces. As a result, nations around the world are actively pursuing missile capabilities.

c. TMs may be used alone or in conjunction with other weapon systems. Their targets can vary from political to military, such as population centers, ports, airfields, headquarters, air defense sites, C2 elements, communications nodes, and logistic centers. They can quickly put key civilian facilities at risk, such as power and water stations, petroleum pumping and storage sites, and industrial complexes. TBMs and CMs also present a serious threat to merchant shipping, critical sea-lanes, and maritime operations in joint littoral warfare, as well as key offensive and defensive forces/complexes and support organizations. ASMs also have proven to be effective weapons against point targets, and they are difficult to defend against.

2. Generic Architecture

Although there are many variables between the different types of TMs, they generally share a common architecture. Countries possessing TMs either import them, reverse-engineer them, and/or develop their own technology. TM programs may have one or more of the following aspects.

a. **Research and Development (R&D).** If a country is developing its own missile system or adapting a system purchased from another country, there will be a center, institution, and personnel responsible for the R&D effort. However, if a country purchases the complete TM system, there may be no R&D effort unless they attempt to improve the design. R&D efforts should provide some signatures for intelligence sources.

b. **Manufacturing.** Countries that develop their own systems or adapt those produced by other nations require dedicated manufacturing and testing facilities. They also may have to develop or refine the fuel for the missile systems. Although the fuels are of a specific type, they are commonly available on the international market from several sources. The manufacturing process should produce signatures and products (the missiles) that intelligence sources should recognize.

c. **Purchase and Import.** Countries that purchase systems from other nations will have prepared sites for receipt of missile system components and fuels. These ports of entry may be air-, land- (road or rail), or sea-based. These locations must have receipt, inspection, and storage capabilities. If the equipment requires assembly, there may be facilities created nearby to support these activities.

d. **Transportation.** TM components must move from their manufacturing or importing site by rail, road, air, and/or sea to permanent storage sites. In some cases, the missiles may be carried by their transporter-erector-launcher unit (TEL). The combination of purchasing and transportation should provide signatures or some trail or recognition for intelligence sources.

e. **Missile Storage.** Missile storage locations are required at the point of manufacture, at the point of receipt, in TM unit base locations, and at training installations. Missile storage sites are likely to be constructed and developed within projected operational areas as well. If not mounted on a TEL, storage may include innocuous containers or special canisters that house the missiles until they are launched.

f. **Warhead Storage.** Warhead storage sites are usually located in ammunition areas and may not be easily discernible from bunkers holding other munitions. However, WMD warheads require specialized storage, handling, and, most notably, higher security. WMD generally have telltale signs for not only storage but for movement as well.

g. **Basing.** TM units are usually located at military bases for OPSEC and safety purposes. Most training and equipment maintenance occurs at these locations. Land-based units likely will move from their garrisons to conduct combat operations. Air units with CMs and ASMs conduct training and wartime operations directly from their home air bases or from dispersal fields. TBM units are likely to utilize passive defense measures such as mobility, dispersal, and concealment to complicate their being targeted. Naval units generally have their TMs aboard ships for added mobility and movement to potential firing locations. Normally, intelligence sources should be able to identify adversaries with TM-capable aircraft and ships.

h. **Assembly Areas.** In cases where TBMs and warheads are shipped and stored separately, one of the final stages of preparing the weapon for operations is mating the warhead to the missile body. This may be a training event so it can be efficiently done for combat operations. For aircraft, the loading process could be an indication and warning for intelligence sources, as would the assembly of TBMs.

i. **Launch Areas.** TM attacks normally take place from planned launch areas. The characteristics of the launch areas are dependent on missile-type. Historically, TBMs usually start from a hide-position then move to the launch point. ASMs must be flown to a launch point within range of the target.

j. **Launch Preparation.** After arrival at a launch area, most TBMs require some prelaunch preparation. These activities may involve fueling and testing the missile and warhead components along with some assembly operations. Launch preparations for liquid-fueled TMs generally require longer setup/checkout time than do solid fuel missiles. For CMs and ASMs, these activities likely will occur at an airfield or port and may involve simply moving the missile from a storage area to the delivery platform (aircraft or ship).

k. **C2.** Planning TM operations is normally a highly centralized process with tight control over the employment and selection of targets. Execution of TM operations may be either centralized or decentralized. The degree of centralization is generally determined by the degree of control desired by senior civilian or military leaders, the capability for secure communications, the ability of the opposing forces to detect or locate transmitters, and the tactics employed. WMD-armed missiles will be tightly controlled because of their political sensitivity and the possibility of retaliation. Thus, WMD-associated TM units normally will require robust communication links or constant communication with national leadership for launch authorization.

l. **Support Units.** Most TM systems require a support system. Support units provide a variety of functions to include maintenance, rearming and refueling, personnel replacement, etc. They also deliver replacement warheads and missiles and conduct all the electronic testing and repair. During peacetime, these units probably will be collocated with the TM firing units in garrison. For employment, they may move to FOBs or dispersal/staging airfields. For naval units the support is likely organic to the ship.

3. Theater Ballistic Missiles

a. **Definition.** TBMs (or SSMs) are characterized by their trajectory, having one or more boosters and an initial steering vector. They have a range of less than 5500 kilometers and can travel this distance in 5 to 20 minutes.

b. **Threat Employment Concepts**

(1) Prime targets for TBMs are large, soft, heavily defended, and deep rear area facilities that are critical to a nation's warfighting ability. Examples include airfields, air defense sites, transportation centers (ports and airfields), logistic hubs, and major C2 nodes. Additionally, key population centers are prime targets whose attack might create panic among the populace and foster a political crisis. TBMs also may be used in a tactical sense to affect battlefield logistics and operations, although this is less likely given the strategic importance of such weapons to smaller or less developed nations.

(2) TBMs normally are carried on a TEL so mobility enhances TBM survivability and, conversely, complicates their being targeted. Their long range affords the enemy increased options in selecting operating areas and determining potential targets. For example, TBMs have been exported by many nations, the Scud and its derivatives being the most common. The Scud employs the full spectrum of warheads. The Scud, as well as the Soviet designed SS-21 Scarab, can be set up and fired in less than 45 minutes and relocated within minutes. Missiles often present multiple tracks, either from staging or from their tendency to break up during terminal phase descent, thereby further complicating defensive efforts.

(3) SAM systems have been modified into SSMs in some countries and this trend likely will spread to other nations. As missile systems and missile technology proliferate, nations will acquire or be able to produce missile systems using solid fuels. This will significantly reduce the dwell time required for system checks and fueling during launch preparation. This reduced dwell time will significantly reduce the TMs signature and the time available for preemptive attack operations.

c. **Threat Employment Operations.** TBM operations generally are broken down into five major phases. These include readiness, deployment, employment, sustainment, and reconstitution.

(1) **Readiness Phase.** The readiness phase encompasses normal day-to-day peacetime operations. During this phase, TBM forces train on wartime tasks and practice doctrinal employment in the local training areas or in garrison. This normally entails TEL operation, missile erection, site preparation, and missile maintenance. Support units will perform maintenance on firing units and conduct resupply operations.

(2) **Deployment Phase.** The deployment phase may include initial movement from the garrison location(s) to the initial war fighting positions to support subsequent launch operations. TBM force deployment will depend on the range to the target, missile capability, terrain, and survivability considerations. Firing units will move to either hide positions or directly into launch positions. Support units likely will move to a forward base and conduct support to include reloading operations. Deployments may or may not convey hostile intent, depending upon the circumstances.

(3) **Employment Phase.** The employment phase encompasses initial combat operations. During this phase, TELs move missiles to their initial firing positions from a hide site and then, after launch, move to another hide site or directly to reload operations. The support unit will establish that location based upon doctrine, terrain, the TBM force commander's firing schedule, and the threat.

(4) **Sustainment Phase.** During the sustainment phase, support units likely will use a forward base/location to conduct the necessary repair/replacement operations to sustain the TBM force. Sustainment operations require support units to use lines of communications from garrison locations, field storage areas, and/or the manufacturing infrastructure/import facilities to the forward bases and onward.

(5) **Reconstitution Phase.** The reconstitution phase encompasses continuous operations between firing units, support units, and higher echelon logistic locations to regenerate TBM forces.

d. **Threat Employment — Tactics, Techniques, and Procedures**

(1) **TEL Operations.** TELs serve as the transporter and launch platform for missiles. One very common TEL is the Soviet-era MAZ-543. TELs present a small, extremely mobile target with very short dwell time. The MAZ-543 has tremendous off-road mobility and can easily hide. TELs generally travel only short distances between hide sites, launch sites, and transload sites, unless required to return to a forward base for additional maintenance. A TEL will be in launch configuration for a very short period of time and can displace to a new hide site in a matter of minutes.

(2) **Transload Site.** The transload site is where fueled, ready missiles are loaded onto TELs. Support unit personnel, vehicles, and equipment from the forward base or location will rendezvous at this site with firing unit TELs. At this site there generally are a number of vehicles: missile resupply vehicles (with one to three missiles), a crane (possibly attached to the resupply vehicle), and other ground support equipment as required by the missile type. The transload site usually is an open area large enough to allow the crane to lift/pivot the missile onto the TEL, approximately 50 by 50 meters. This operation can occur in large buildings or underground facilities with sufficient height, approximately 20 meters. When detected, this site will remain vulnerable throughout its established dwell time.

(3) **FOL.** An FOL is typically where warheads and missiles are mated, missiles are fueled, and missiles are loaded onto the resupply vehicle. A FOL remains in place from half-a day to 3 days. The FOL usually contains warheads and missile airframes, transporters, cranes, checkout vehicles, fuel trucks (vehicle and missile fuel), and resupply and other support vehicles. FOLs can be located in rural or urban settings and may be hidden in a building complex or underground facility. The FOL has a larger footprint than TEL or transload operations, but is still difficult to locate. Some countries may not employ FOLs, preferring to conduct these operations out of the FOB.

(4) **FOB.** The FOB is the main TM unit supply and storage activity and will be spread out over a large geographic area for survivability. The number of FOBs will depend on the size of the missile force (targets selected and acceptable travel distances for support units). In situations where a country's geographic area is small, it is possible that operations typically associated with the FOB could be conducted from garrison.

(a) A typical FOB contains warhead, missile, and propellant storage sites; transporters and cranes; checkout vehicles; fuel trucks (vehicle and missile fuel); and resupply and other support vehicles. An FOB can be established in an urban environment hidden in large buildings, in underground facilities, or in the field. The FOB normally will deploy support equipment to FOLs and/or transload sites as needed to sustain launch operations. FOBs require robust lines of communications (primarily roads and rail lines) to support continuous operations.

(b) The FOB cannot be easily hidden but may be difficult to distinguish from other logistic facilities. Once established, the FOB probably will not be moved in total, but certain components may be moved to complicate detection, create a deception, or facilitate launch operations.

4. Cruise Missiles

a. **Definition.** CMs are defined as a guided missile, the major portion of whose flight path to its target is conducted at approximately constant velocity, and depends on the dynamic reaction of air for lift and upon propulsion forces to balance drag. CMs are unmanned, self-propelled vehicles that sustain flight through the use of aerodynamic lift over most of their flight. CMs usually navigate autonomously to targets and, depending on their sophistication can position themselves through a number of update methods along extended flight routes. CMs are capable of delivering the full complement of warheads from conventional to WMD.

b. **Threat CMs**

(1) Very few nations currently possess sophisticated CMs such as the Navy Tomahawk land attack missile or the Air Force conventional air launched cruise missile (ALCM). Employment by developed nations has been limited. The majority of CMs in potential threat nations are short-range anti-ship/coastal defense CMs with ranges up to 100 nautical miles such as China's Silkworm. Some countries are modifying anti-ship CMs for a land attack role.

(2) Future CM technology will build on existing low observable, sensor defeating designs using radar absorbing materials and composite materials such as Kevlar or carbon fiber to further reduce their radar cross-sections and render them more difficult to detect. CMs generally possess some of the following features:

(a) Radar cross-section under 1 square meter (-10 decibel and lower).

(b) Low infrared signature (varies by type of CM).

(c) Acoustic signature (varies by type of CM).

(d) Cruise altitude of 100 feet to 2000 feet above ground level or 50,000 feet above mean sea level.

(e) Range of 100 to 1000 nautical miles.

(f) Payload of 200 to 1000 pounds.

(g) Speed range of high subsonic (low altitude) or supersonic (high altitude).

(h) Air-, land-, or sea-launched.

c. **Threat CM Employment**

(1) CMs put stress on air defense systems because they are difficult for theater sensors and weapons systems to detect, identify, track, acquire, and destroy. CMs are more difficult to detect than the larger TBMs because they do not give off as large a heat signature at launch, fly at very low altitudes during their attack legs, and normally have a smaller radar cross-section. Ground-based surveillance radars have a difficult time detecting CMs when in low level flight (following terrain contours) because of line-of-sight restrictions created by radar horizon and terrain masking. Similarly, airborne radar systems may have a difficult time isolating CMs from ground clutter. These traits, when combined with radar evasion techniques and low observable construction methods, cause delays in detection and engagement decisions by engagement authorities and shooters per the ROE. However, once detected in flight, CMs can be engaged by fighters, AAA, and SAMs. The best tactic is to shoot down the aircraft carrying the CMs.

(2) SLCMs and ground-launched CMs (GLCMs) present opportunities for detection as well as challenges for surveillance systems. Surface launch systems normally must be boosted to "cruise" altitude. The boosted phase often uses a rocket motor that will produce an infrared signature that could potentially be exploited by space-based or properly positioned theater assets. ALCMs do not have a boost plume since aircraft or UASs deliver them above the cruise altitude. Although the ALCM has a small radar cross-section, it is vulnerable to radar detection during descent to its low-level altitude. Once near the surface and in a terrain following mode, sensors have to filter radar ground clutter to extract a radar signature from these low-altitude profile missiles.

(3) High-altitude, high-mach profiles rely on altitude and speed to overcome defenses. Because the CM is high, ground-based radars will not be obstructed by the curvature of the earth and airborne radars can discriminate them from ground clutter. As a result, when using the high-altitude profile, CMs are more likely to be detected earlier in flight than when using a low-level profile.

(4) CMs provide a significant standoff range for the aircraft or launch platform and remove the "manned" component of the weapons system from the immediate target area. The release range of CMs from aircraft and other platforms can easily be beyond a defender's radar and sensor range. The long distance release or launch of CMs and their smaller radar signature increase the possibility that surveillance assets will not detect them. Battle managers require cues to focus their search in detecting CMs in any surveillance area. Combining hostile aircraft attacks with CM and ASM attacks may allow "leakers" to get through. Indeed, CMs may resemble and be misidentified as manned aircraft.

(5) Rapid CID is critical for CM defense. CM defense is complicated by the use of low observable technology and the potential of SOF or other friendly aircraft without IFF transponders operating in the same airspace, thus requiring ID verification prior to engagement. CMs make surveillance and detection difficult because their flight profiles are specifically designed to defeat or confuse radar tracking. As with TBMs, the objective is to eliminate as many CMs as possible before launch. CMs in flight may be part of TST target sets designated by the JFC. The

challenge for defending against CMs is to find them early, before launch if possible, and engage them before they can navigate to their targets.

(6) Training patterns or identifiable launch sequence events for GLCMs are rarely observed or practiced in an overt environment. Consequently, the probability is small for conclusively identifying a GLCM TEL using current sensor data. Attacking a CM TEL requires the earliest possible detection of the target and the ability of sensors to discriminate between TELs and other targets. Successfully targeting CMs before launch will depend in great part on pre-hostility IPOE efforts. Targeteers will require information on infrastructure, logistic support patterns, movement discipline, and signatures of typical storage and assembly facilities. Identification by signature is key to finding CMs before launch, since detecting the launch itself or tracing the flight path back to the launch site may be extremely difficult when they are launched from maximum range.

d. **CM Target Development**

(1) Procedures for finding and targeting CMs on the ground are no different than for finding other targets using a variety of theater and national sensors. Space-based and theater reconnaissance, surveillance, and target acquisition assets normally will collect intelligence data on these targets prior to armed conflict as part of IPOE. Sensors on JSTARS and UASs and SOF pass CM target information to analysts and battle managers by data link or voice. Data collected and fused from multiple sensors will provide the necessary confirmation of the target. Immediate threat data will be broadcast over intelligence processing and transmissions systems such as tactical related applications and tactical data dissemination systems.

(2) When conflict begins, sensors must be used to validate known target information. With proper ISR, aircraft and naval launch platforms for ALCMs and SLCMs provide identifiable signatures and will yield opportunities to detect, ID, track, and attack those platforms. GLCMs will present a more difficult target set. The following is a discussion of targeting methods against each category:

(a) **ALCM.** Destroying ALCM-capable aircraft on the ground or neutralizing their supporting airstrips/bases is the best means to prevent ALCM employment. In this context, missions against this target system do not differ from other OCA missions in terms of tactics or weapons. The IPOE process must focus on providing the intelligence that targeteers need to determine which aircraft and air bases support ALCM activity and task missions against them accordingly.

(b) **SLCM.** Destroying the launch platform in port is the best means to prevent SLCM launch. The IPOE process will provide the naval order of battle information to identify specific SLCM carriers and support bases for targeteers and battle managers to task missions against them. Signatures of naval vessels and their substantial support base infrastructure will facilitate finding SLCM targets by satellite, UAS, and other surveillance platforms.

(c) **GLCM.** GLCM platforms normally are an adaptation of any available vehicle chassis capable of supporting one to two tons. Any medium-to-large size truck or tracked vehicle could be developed into a CM TEL. These TELs likely will be considerably smaller and less distinct than heavier TBM TELs; however, a robust IPOE effort can catalog such known and suspected vehicles for exploitation by surveillance sensors. GLCM deployment and training in suspect nations must be collected against and studied for behavioral cues to detection. Long-range GLCM permit the enemy to establish a large number of well-dispersed, fixed-launch locations (both actual and decoys) deep within their own territory. The enemy can be expected to employ camouflage, concealment, and deception for fixed and mobile TELs to reduce probability of detection. Detecting and targeting mobile GLCM platforms or newly built fixed launch sites will depend on a robust IPOE, dynamic management of ISR assets, dedicated and trained analysts aided by technology improvements such as automatic target recognition systems, and a responsive C2 architecture.

5. Air-to-Surface Missiles

ASMs employment can be expected on all battlefields. Like TBMs and CMs, ASMs are capable of delivering a complete range of warheads and can be carried by a variety of rotary- and fixed-wing platforms. Flight profiles, short flight times, and reduced radar cross-section make these missiles difficult to detect, track, and engage. Additionally, their speed and relatively short flight times leave a small window for interception. ASMs increase the survivability of the delivery platform through standoff capability, usually beyond the range of some point defenses. Many of the North Atlantic Treaty Organization and former Warsaw Pact nations are equipped with US and Russian manufactured systems and have exported them throughout the world. The best method for countering ASMs is to target the delivery platforms and related bases and facilities.

6. Conclusion

While each TM system is unique, each category (TBM, CM, and ASM) exhibits similar characteristics and functional operations. This appendix provides the essential framework for each in a generic fashion and serves as a foundation for an initial understanding of how TMs are employed. Specific analysis is required to apply this information to a particular missile system and country. The following vignette is a reminder that some "facts" should be verified, not simply accepted.

THE LURE OF THE UNEXPECTED

Deception is a key part of any combat operations. The examples below illustrate what happens when analysts stop analyzing events and begin to believe what they think they are seeing.

World War II

Prior to the beginning of the V-1 attacks against London on June 12, 1944, the Allied attack operations concentrated on an elaborate system of "sites"

which were believed to be Nazi V-1 launch locations. The locations were dubbed "ski sites" because of the shape of several long, curved buildings that were characteristic in the aerial photographs of each location. These sites were targeted and heavily bombed from December 1943 through May 1944. Although the "ski sites" were largely destroyed, not one of the real V-1 sites was attacked during this period. Once Hitler unleashed his missile force on England in June, the volume of V-1 launches provided incontrovertible evidence that a second set of launch sites was actually being used. Not until then did the weight of the Allied bombing effort finally begin to shift to the correct targets. Even so, the real sites were so hard to find due to Nazi camouflage and concealment measures that attacks were still being made on nearby decoy "ski sites" until the end of June.

SOURCE: Based on Operation CROSSBOW Volume of the US Strategic Bombing Survey

Gulf War

The initial hope of the planners in Riyadh that heavy attacks on the fixed Scud sites during the opening hours of the air campaign would largely eliminate Iraq's capability to launch TBMs against Israel or regional members of the US-led Coalition proved to be illusory. On the night of 16-17 January 1991, the fixed Scud launchers in western Iraq functioned as "decoys" that diverted attention away from the mobile launchers that had already deployed to their wartime "hide" sites, and the first of Iraq's extended-range Scuds were fired at Israel the following night. Once Scuds started falling, first on Israel and then on Saudi Arabia two days later, the next best military option would have been to locate and attack mobile launchers before they had time to fire. Soviet exercise patterns in central Europe with Scud-B's and Iraqi practice during the Iran-Iraq War, indicated that if the Iraqis followed prior practices, there might be enough pre-launch signatures and time to give patrolling aircraft some chance of attacking mobile launchers before they fired. However, the Iraqis dramatically cut their pre-launch set-up times, avoided any pre-launch electromagnetic emissions that might give away their locations before launch, and seeded the launch areas with decoys (some of which were very high in fidelity). . . . most (and possibly all) of the roughly 100 mobile launchers reported destroyed by Coalition aircraft and special operation forces now appear to have been either decoys, other vehicles such as tanker trucks, or other objects unfortunate enough to provide "Scud-like" signatures.

SOURCE: Gulf War Air Power Survey, 1993

APPENDIX E
REFERENCES

The development of JP 3-01 is based upon the following primary references.

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a. CJCSM 3115.01A, *Joint Data Networks Operations Manual.*

b. CJCSI 3121.01B, *Standing Rules of Engagement/Standing Rules for the Use of Force for US Forces.*

c. CJCSI 3151.01A, *Global Command and Control System Common Operational Picture Reporting Requirements.*

d. CJCSI 5120.02, *Joint Doctrine Development System.*

e. CJCSM 6120.01D, *Joint Multi-Tactical Data Link Operating Procedures (JMTOP).*

2. Joint Publications

a. JP 1, *Doctrine for the Armed Forces of the United States*.

b. JP 0-2, *Unified Action Armed Forces (UNAAF).*

c. JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*.

d. JP 2-0, *Joint Intelligence*.

e. JP 2-01, *Joint and National Intelligence Support to Military Operations*.

f. JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment.*

g. JP 3-0, *Joint Operations*.

h. JP 3-10, *Joint Security Operations in Theater*.

i. JP 3-13, *Information Operations.*

j. JP 3-13.1, *Electronic Warfare.*

k. JP 3-14, *Joint Doctrine for Space Operations.*

l. JP 3-16, *Multinational Operations*.

m. JP 3-27, *Homeland Defense*.

n. JP 3-30, *Command and Control for Joint Air Operations*.

o. JP 3-33, *Joint Task Force Headquarters*.

p. JP 3-52, *Joint Doctrine for Airspace Control in the Combat Zone*.

q. JP 5-0, *Joint Operations Planning*.

r. JP 6-0, *Joint Communications System*.

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e. FM 3-52.2/MCRP 3-25F/NTTP 3- 56.2/AFTTP(I) 3-2.17, *Multi-Service Tactics, Techniques, and Procedures for the Theater Air-Ground System (TAGS)*.

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g. Military Standard 6016A, *Tactical Digital Information Link (TADIL) J Message Standard*.

4. Service Publications

a. Air Force Doctrine Document 2-1.1, *Counterair Operations*.

b. Air Force Doctrine Document 2-1.7, *Airspace Control in the Combat Zone*.

c. FM 301.94, *Army Air and Missile Defense Command Operations*.

d. FM 44-100, *US Army Air and Missile Defense Operations*.

e. MCWP 3-22, *Antiair Warfare*.

f. Naval Warfare Publication 3-01.01, *Fleet Air Defense*.

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APPENDIX F
ADMINISTRATIVE INSTRUCTIONS

1. User Comments

Users in the field are highly encouraged to submit comments on this publication to: Commander, United States Joint Forces Command, Joint Warfighting Center, ATTN: Joint Doctrine Group, 116 Lake View Parkway, Suffolk, VA 23435-2697. These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.

2. Authorship

The lead agent for this publication is the US Joint Forces Command. The Joint Staff doctrine sponsor for this publication is the Director for Operations (J-3).

3. Supersession

This publication supersedes JP 3-01, 19 October 1999, *Joint Doctrine for Countering Theater Air and Missile Threats*, JP 3-01.4, 25 July 1995, *JTTP for Joint Suppression of Enemy Air Defenses (J-SEAD),* and JP 3-01.5, 22 February 1996, *Doctrine for Joint Theater Missile Defense*, and subsumes two publications that were held in final coordination: JP 3-01.2, 19 August 2002, *Joint Doctrine for Offensive Operations for Countering Air and Missile Threats,* and JP 3-01.3, 22 November 2002, *Joint Doctrine for Defensive Operations for Countering Air and Missile Threat.*

4. Change Recommendations

a. Recommendations for urgent changes to this publication should be submitted:

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Routine changes should be submitted electronically to Commander, Joint Warfighting Center, Joint Doctrine Group and info the Lead Agent and the Director for Operational Plans and Joint Force Development J-7/JEDD via the CJCS JEL at http://www.dtic.mil/doctrine.

b. When a Joint Staff directorate submits a proposal to the Chairman of the Joint Chiefs of Staff that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal. The Military Services and other organizations are requested to notify the Joint Staff/J-7 when changes to source documents reflected in this publication are initiated.

c. Record of Changes:

CHANGE NUMBER	COPY NUMBER	DATE OF CHANGE	DATE ENTERED	POSTED BY	REMARKS

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c. Additional copies should be obtained from the Military Service assigned administrative support responsibility by DOD Directive 5100.3, 15 November 1999, *Support of the Headquarters of Unified, Specified, and Subordinate Joint Commands*.

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GLOSSARY
PART I — ABBREVIATIONS AND ACRONYMS

AAA	antiaircraft artillery
AADC	area air defense commander
AADP	area air defense plan
AAGS	Army air-ground system
AAMDC	Army Air and Missile Defense Command
AAW	antiair warfare
ACA	airspace control authority
ACCE	air component coordination element
ACE	aviation combat element
ACM	airspace coordinating measure
ACO	airspace control order
ACP	airspace control plan
ACS	airspace control system
AD	air defense
ADA	air defense artillery
ADAFCO	air defense artillery fire control officer
ADC	air defense commander
ADW	air defense warnings
ADWC	air defense warning condition
AFFOR	Air Force forces
AFTTP(I)	Air Force tactics, techniques, and procedures (instruction)
ALCM	air launched cruise missile
AMD	air and missile defense
AO	area of operations
AOR	area of responsibility
AR	air refueling
ARFOR	Army forces
ARM	antiradiation missile
ASM	air-to-surface missile
ASOC	air support operations center
ATC	air traffic control
ATO	air tasking order
AWACS	Airborne Warning and Control System
BCA	border crossing authority
BCD	battlefield coordination detachment
BM	ballistic missile
C2	command and control
CAL	critical asset list
CAP	combat air patrol
CBRN	chemical, biological, radiological, and nuclear

CCDR	combatant commander
CDRNORAD	Commander, North American Aerospace Defense Command
CDRUSJFCOM	Commander, United States Joint Forces Command
CDRUSNORTHCOM	Commander, United States Northern Command
CDRUSPACOM	Commander, United States Pacific Command
CDRUSSOUTHCOM	Commander, United States Southern Command
CDRUSSTRATCOM	Commander, United States Strategic Command
CID	combat identification
CJCSI	Chairman of the Joint Chiefs of Staff instruction
CJCSM	Chairman of the Joint Chiefs of Staff manual
CM	cruise missile
COA	course of action
COG	center of gravity
COMAFFOR	commander, Air Force forces
COMMARFOR	commander, Marine Corps forces
COP	common operational picture
CRC	control and reporting center
CTP	common tactical picture
CVT	criticality-vulnerability-threat
DAADC(AMD)	deputy area air defense commander for air and missile defense
DAL	defended asset list
DCA	defensive counterair
DIRNSA	Director of National Security Agency
DOCC	deep operations coordination cell
ECM	electronic countermeasures
EMP	electromagnetic pulse
EW	electronic warfare
EWCC	electronic warfare coordination cell
FECC	fires and effects coordination cell
FEZ	fighter engagement zone
FM	field manual
FOB	forward operating base
FOL	forward operating location
FSCL	fire support coordination line
FSCM	fire support coordination measure
GCI	ground control intercept
GLCM	ground launched cruise missile
GMD	global missile defense

HIMEZ	high-altitude missile engagement zone
HN	host nation
HVAA	high value airborne asset
IADS	integrated air defense system
ID	identification
IFF	identification, friend or foe
IO	information operations
IPOE	intelligence preparation of the operational environment
ISR	intelligence, surveillance, and reconnaissance
J-2	intelligence directorate of a joint staff
J-3	operations directorate of a joint staff
J-6	communications system directorate of a joint staff
JAOC	joint air operations center
JAOP	joint air operations plan
JDN	joint data network
JDNO	joint data network operations officer
JEZ	joint engagement zone
JFACC	joint force air component commander
JFC	joint force commander
JFCC-IMD	Joint Functional Component Command for Integrated Missile Defense
JFIIT	Joint Fires Integration and Interoperability Team
JFLCC	joint force land component commander
JFMCC	joint force maritime component commander
JFMO	joint frequency management office
JFSOCC	joint force special operations component commander
JICC	joint interface control cell
JICO	joint interface control officer
JIPOE	joint intelligence preparation of the operational environment
JOA	joint operations area
JP	joint publication
JRFL	joint restricted frequency list
JSA	joint security area
JSOTF	joint special operations task force
JSTARS	Joint Surveillance Target Attack Radar System
JTF	joint task force
LOMEZ	low-altitude missile engagement zone
MAAP	master air attack plan
MACCS	Marine air command and control system
MAGTF	Marine air-ground task force
MANPADS	man-portable air defense system

MARFOR	Marine Corps forces
MARLO	Marine liaison officer
MCRP	Marine Corps reference publication
MCWP	Marine Corps warfighting publication
MEZ	missile engagement zone
MNF	multinational force
MNFC	multinational force commander
MRR	minimum-risk route
MTN	multi-tactical data link network
NALE	naval and amphibious liaison element
NAVFOR	Navy forces
NORAD	North American Aerospace Defense Command
NTACS	Navy tactical air control system
NTTP	naval tactics, techniques, and procedures
OCA	offensive counterair
OPCON	operational control
OPLAN	operation plan
OPSEC	operations security
OPTASKLINK	operations task link
PPLI	precise participant location and identification
R&D	research and development
RADC	regional air defense commander
RICO	regional interface control officer
ROE	rules of engagement
SADC	sector air defense commander
SAM	surface-to-air missile
SCA	space coordinating authority
SEAD	suppression of enemy air defenses
SHORAD	short-range air defense
SHORADEZ	short-range air defense engagement zone
SICO	sector interface control officer
SJA	staff judge advocate
SLCM	sea-launched cruise missile
SOF	special operations forces
SOLE	special operations liaison element
SPINS	special instructions
SROE	standing rules of engagement
SRUF	standing rules for the use of force
SSM	surface-to-surface missile

TAAMDCOORD	theater Army air and missile defense coordinator
TACC	tactical air command center (USMC); tactical air control center (USN)
TACON	tactical control
TACOPDAT	tactical operational data
TACP	tactical air control party
TACS	theater air control system
TAGS	theater air ground system
TAOC	tactical air operations center (USMC)
TBM	theater ballistic missile
TDL	tactical data link
TEL	transporter-erector-launcher
TM	theater missile
TST	time-sensitive target
UA	unmanned aircraft
UAS	unmanned aircraft system
UCP	Unified Command Plan
USSTRATCOM	United States Strategic Command
WCS	weapons control status
WEZ	weapon engagement zone
WMD	weapons of mass destruction

active air defense. Direct defensive action taken to destroy, nullify, or reduce the effectiveness of hostile air and missile threats against friendly forces and assets. It includes the use of aircraft, air defense weapons, electronic warfare, and other available weapons. (JP 1-02)

air defense. Defensive measures designed to destroy attacking enemy aircraft or missiles in the atmosphere, or to nullify or reduce the effectiveness of such attack. Also called AD. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

air defense action area. None. (Approved for removal from the next edition of JP 1-02.)

air defense area. 1. overseas — A specifically defined airspace for which air defense must be planned and provided. 2. United States — Airspace of defined dimensions designated by the appropriate agency within which the ready control of airborne vehicles is required in the interest of national security during an air defense emergency. (JP 1-02)

air defense battle zone. None. (Approved for removal from the next edition of JP 1-02.)

air defense control center. The principal information, communications, and operations center from which all aircraft, antiaircraft operations, air defense artillery, guided missiles, and air warning functions of a specific area of air defense responsibility are supervised and coordinated. Also called air defense operations center. (JP 1-02)

air defense direction center. An installation having the capability of performing air surveillance, interception, control, and direction of allocated air defense weapons within an assigned sector of responsibility. It may also have an identification capability. (JP 1-02)

air defense division. None. (Approved for removal from the next edition of JP 1-02.)

air defense region. A geographical subdivision of an air defense area. (JP 1-02)

air defense sector. A geographical subdivision of an air defense region. (JP 1-02)

air defense suppression. None. (Approved for removal from the next edition of JP 1-02.)

air defense warning conditions. A degree of air raid probability according to the following code. The term air defense region/sector referred to herein may include forces and units afloat and/or deployed to forward areas, as applicable. Air defense warning yellow — attack by hostile aircraft and/or missiles is probable. This means that hostile aircraft and/or missiles are en route toward an air defense region/sector, or unknown aircraft and/or missiles suspected to be hostile are en route toward or are within an air defense region/sector. Air defense warning red — attack by hostile aircraft and/or missiles is imminent or is in progress. This means that hostile aircraft and/or missiles

are within an air defense region/sector or are in the immediate vicinity of an air defense region/sector with high probability of entering the region/sector. Air defense warning white — attack by hostile aircraft and/or missiles is improbable. May be called either before or after air defense warning yellow or red. The initial declaration of air defense emergency will automatically establish a condition of air defense warning other than white for purposes of security control of air traffic. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

air interception. To effect visual or electronic contact by a friendly aircraft with another aircraft. Normally, the air intercept is conducted in the following five phases: a. climb phase - Airborne to cruising altitude. b. maneuver phase - Receipt of initial vector to target until beginning transition to attack speed and altitude. c. transition phase - Increase or decrease of speed and altitude required for the attack. d. attack phase - Turn to attack heading, acquire target, complete attack, and turn to breakaway heading. e. recovery phase - Breakaway to landing. (JP 1-02)

air intercept zone. None. (Approved for removal from the next edition of JP 1-02.)

airspace control area. Airspace that is laterally defined by the boundaries of the operational area, and may be subdivided into airspace control sectors. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

airspace control authority. The commander designated to assume overall responsibility for the operation of the airspace control system in the airspace control area. Also called ACA. (JP 1-02)

airspace control in the combat zone. A process used to increase combat effectiveness by promoting the safe, efficient, and flexible use of airspace. Airspace control is provided in order to reduce the risk of friendly fire, enhance air defense operations, and permit greater flexibility of operations. Airspace control does not infringe on the authority vested in commanders to approve, disapprove, or deny combat operations. Also called airspace control; combat airspace control. (JP 1-02)

airspace control order. An order implementing the airspace control plan that provides the details of the approved requests for airspace coordinating measures. It is published either as part of the air tasking order or as a separate document. Also called ACO. (JP 1-02)

airspace control plan. The document approved by the joint force commander that provides specific planning guidance and procedures for the airspace control system for the joint force operational area. Also called ACP. (JP 1-02)

airspace coordinating measures. Measures employed to facilitate the efficient use of airspace to accomplish missions and simultaneously provide safeguards for friendly forces. Also called ACMs. See also airspace control area; weapon engagement zone. (JP 1-02)

air superiority. That degree of dominance in the air battle of one force over another that permits the conduct of operations by the former and its related land, sea, and air forces at a given time and place without prohibitive interference by the opposing force. (JP 1-02)

air supremacy. That degree of air superiority wherein the opposing air force is incapable of effective interference. (JP 1-02)

air tasking order. A method used to task and disseminate to components, subordinate units, and command and control agencies projected sorties, capabilities and/or forces to targets and specific missions. Normally provides specific instructions to include call signs, targets, controlling agencies, etc., as well as general instructions. Also called ATO. (JP 1-02)

allocation (air). The translation of the air apportionment decision into total numbers of sorties by aircraft type available for each operation or task. (JP 1-02)

apportionment (air). The determination and assignment of the total expected effort by percentage and/or by priority that should be devoted to the various air operations for a given period of time. Also called air apportionment. (JP 1-02)

area air defense commander. Within a unified command, subordinate unified command, or joint task force, the commander will assign overall responsibility for air defense to a single commander. Normally, this will be the component commander with the preponderance of air defense capability and the command, control, and communications capability to plan and execute integrated air defense operations. Representation from the other components involved will be provided, as appropriate, to the area air defense commander's headquarters. Also called AADC. (JP 1-02)

area of operations. An operational area defined by the joint force commander for land and maritime forces. Areas of operation do not typically encompass the entire operational area of the joint force commander, but should be large enough for component commanders to accomplish their missions and protect their forces. Also called AO. (JP 1-02)

ballistic missile. Any missile which does not rely upon aerodynamic surfaces to produce lift and consequently follows a ballistic trajectory when thrust is terminated. (JP 1-02)

barrier combat air patrol. One or more divisions or elements of fighter aircraft employed between a force and an objective area as a barrier across the probable direction of enemy attack. It is used as far from the force as control conditions permit, giving added protection against raids that use the most direct routes of approach. See also combat air patrol. (JP 1-02)

base defense zone. An air defense zone established around an air base and limited to the engagement envelope of short-range air defense weapons systems defending that base. Base defense zones have specific entry, exit, and identification, friend or foe procedures established. Also called BDZ. (JP 1-02)

battle management. The management of activities within the operational environment based on the commands, direction, and guidance given by appropriate authority. (Approved for inclusion in the next edition of JP 1-02.)

boost phase. That portion of the flight of a ballistic missile or space vehicle during which the booster and sustainer engines operate. See also midcourse phase; terminal phase. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

center of gravity. The source of power that provides moral or physical strength, freedom of action, or will to act. Also called COG. (JP 1-02)

centralized control. 1. In air defense, the control mode whereby a higher echelon makes direct target assignments to fire units. 2. In joint air operations, placing within one commander the responsibility and authority for planning, directing, and coordinating a military operation or group/category of operations. (JP 1-02)

combat air patrol. An aircraft patrol provided over an objective area, the force protected, the critical area of a combat zone, or in an air defense area, for the purpose of intercepting and destroying hostile aircraft before they reach their targets. Also called CAP. (JP 1-02)

combat identification. The process of attaining an accurate characterization of detected objects in the operational environment sufficient to support an engagement decision. Also called CID. (JP 1-02)

command and control. The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. Also called C2. (JP 1-02)

command relationships. The interrelated responsibilities between commanders, as well as the operational authority exercised by commanders in the chain of command; defined further as combatant command (command authority), operational control, tactical control, or support. (JP 1-02)

common operational picture. A single identical display of relevant information shared by more than one command. A common operational picture facilitates collaborative planning and assists all echelons to achieve situational awareness. Also called COP. (JP 1-02)

common tactical picture. An accurate and complete display of relevant tactical data that integrates tactical information from the multi-tactical data link network, ground network, intelligence network, and sensor networks. Also called CTP. (Approved for inclusion in the next edition of JP 1-02.)

coordinating altitude. A procedural airspace control method to separate fixed- and rotary-wing aircraft by determining an altitude below which fixed-wing aircraft normally will not fly and above which rotary-wing aircraft normally will not fly. The coordinating altitude is normally specified in the airspace control plan and may include a buffer zone for small altitude deviations. (JP 1-02)

counterair. A mission that integrates offensive and defensive operations to attain and maintain a desired degree of air superiority. Counterair missions are designed to destroy or negate enemy aircraft and missiles, both before and after launch. (JP 1-02)

course of action. 1. Any sequence of activities that an individual or unit may follow. 2. A possible plan open to an individual or commander that would accomplish, or is related to the accomplishment of the mission. 3. The scheme adopted to accomplish a job or mission. 4. A line of conduct in an engagement. 5. A product of the Joint Operation Planning and Execution System concept development phase and the course-of-action determination steps of the joint operation planning process. Also called COA. (JP 1-02)

critical asset list. A prioritized list of assets, normally identified by phase of the operation and approved by the joint force commander, that should be defended against air and missile threats. Also called the CAL. (Approved for inclusion in the next edition of JP 1-02.)

cruise missile. Guided missile, the major portion of whose flight path to its target is conducted at approximately constant velocity, depends on the dynamic reaction of air for lift and upon propulsion forces to balance drag. (JP 1-02)

decentralized control. In air defense, the normal mode whereby a higher echelon monitors unit actions, making direct target assignments to units only when necessary to ensure proper fire distribution or to prevent engagement of friendly aircraft. See also centralized control. (JP 1-02)

decentralized execution. Delegation of execution authority to subordinate commanders. (JP 1-02)

defended asset list. In defensive counterair operations, a listing of those assets from the critical asset list prioritized by the joint force commander to be defended with the resources available. Also called DAL. (Approved for inclusion in the next edition of JP 1-02.)

defensive counterair. All defensive measures designed to detect, identify, intercept, and destroy or negate enemy forces attempting to penetrate or attack through friendly airspace. Also called DCA. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

direct support. A mission requiring a force to support another specific force and authorizing it to answer directly to the supported force's request for assistance. Also called DS. (JP 1-02)

electronic warfare. Any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. Electronic warfare consists of three divisions: electronic attack, electronic protection, and electronic warfare support. Also called EW. (JP 1-02)

fighter escort. An offensive counterair operation providing dedicated protection sorties by air-to-air capable fighters in support of other offensive air and air support missions over enemy territory, or in a defensive counterair role to protect high value airborne assets. (Approved for inclusion in the next edition of JP 1-02.)

fighter sweep. An offensive mission by fighter aircraft to seek out and destroy enemy aircraft or targets of opportunity in a designated area. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

fires. The use of weapon systems to create a specific lethal or nonlethal effect on a target. (JP 1-02)

functional component command. A command normally, but not necessarily, composed of forces of two or more Military Departments which may be established across the range of military operations to perform particular operational missions that may be of short duration or may extend over a period of time. (JP 1-02)

high value airborne asset protection. A defensive counterair mission that defends airborne national assets which are so important that the loss of even one could seriously impact US warfighting capabilities or provide the enemy with significant propaganda value. Examples of high value airborne assets are Airborne Warning and Control System, Rivet Joint, Joint Surveillance and Target Attack Radar System, and Compass Call. Also called HVAA protection. (JP 1-02)

homeland defense. The protection of United States sovereignty, territory, domestic population, and critical defense infrastructure against external threats and aggression or other threats as directed by the President. Also called HD. (This term and its definition are provided for information and are proposed for inclusion in the next edition of JP 1-02 by JP 3-27.)

identification. 1. The process of determining the friendly or hostile character of an unknown detected contact. 2. In arms control, the process of determining which nation is responsible for the detected violations of any arms control measure. 3. In ground combat operations, discrimination between recognizable objects as being friendly or enemy, or the name that belongs to the object as a member of a class. Also called ID. (JP 1-02)

immediate targets. Targets that have been identified too late, or not selected for action in time to be included in the normal targeting process, and therefore have not been scheduled. Immediate targets have two subcategories: unplanned and unanticipated. (JP 1-02)

information operations. The integrated employment of the core capabilities of electronic warfare, computer network operations, psychological operations, military deception, and operations security, in concert with specified supporting and related capabilities, to influence, disrupt, corrupt or usurp adversarial human and automated decision making while protecting our own. Also called IO. (JP 1-02)

intelligence, surveillance, and reconnaissance. An activity that synchronizes and integrates the planning and operation of sensors, assets, and processing, exploitation, and dissemination systems in direct support of current and future operations. This is an integrated intelligence and operations function. Also called ISR. (JP 1-02)

joint air operations. Air operations performed with air capabilities/forces made available by components in support of the joint force commander's operation or campaign objectives, or in support of other components of the joint force. (JP 1-02)

joint air operations plan. A plan for a connected series of joint air operations to achieve the joint force commander's objectives within a given time and joint operational area. Also called JAOP. (JP 1-02)

joint force. A general term applied to a force composed of significant elements, assigned or attached, of two or more Military Departments operating under a single joint force commander. (JP 1-02)

joint force air component commander. The commander within a unified command, subordinate unified command, or joint task force responsible to the establishing commander for making recommendations on the proper employment of assigned, attached, and/or made available for tasking air forces; planning and coordinating air operations; or accomplishing such operational missions as may be assigned. The joint force air component commander is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. Also called JFACC. (JP 1-02)

joint force commander. A general term applied to a combatant commander, subunified commander, or joint task force commander authorized to exercise combatant command (command authority) or operational control over a joint force. Also called JFC. (JP 1-02)

joint interface control officer. The senior interface control officer for multi-tactical data link networks in the joint force. Responsible for development and validation of the architecture and the joint interoperability and management of the multi-tactical data link networks. Oversees operations of a joint interface control cell. Also called JICO. (Approved for inclusion in the next edition of JP 1-02.)

joint suppression of enemy air defenses. A broad term that includes all suppression of enemy air defense activities provided by one component of the joint force in support of another. Also called J-SEAD. (JP 1-02)

joint theater missile defense. None (Approved for removal from the next edition of JP 1-02.)

master air attack plan. A plan that contains key information that forms the foundation of the joint air tasking order. Sometimes referred to as the air employment plan or joint air tasking order shell. Information that may be found in the plan includes joint force commander guidance, joint force air component commander guidance, support plans, component requests, target update requests, availability of capabilities and forces, target information from target lists, aircraft allocation, etc. Also called MAAP. (JP 1-02)

midcourse phase. That portion of the flight of a ballistic missile between the boost phase and the terminal phase. See also boost phase; terminal phase. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

missile defense. Defensive measures designed to destroy attacking enemy missiles, or to nullify or reduce the effectiveness of such attack. (Approved for inclusion in the next edition of JP 1-02.)

offensive counterair. Offensive operations to destroy, disrupt, or neutralize enemy aircraft, missiles, launch platforms, and their supporting structures and systems both before and after launch, but as close to their source as possible. Offensive counterair operations range throughout enemy territory and are generally conducted at the initiative of friendly forces. These operations include attack operations, suppression of enemy air defenses, fighter escort, and fighter sweep. Also called OCA. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

offensive counterair attack operations. Offensive action in support of the offensive counterair mission against surface targets which contribute to the enemy's air power capabilities. Any part of the joint force may be tasked to conduct or support offensive counterair attack operations. Also called OCA attack ops. See also counterair; offensive counterair. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

operational control. Command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command (command authority) and may be delegated within the command. When forces are transferred between combatant commands, the command relationship the gaining commander will exercise (and the losing commander will relinquish) over these forces must be specified by the Secretary of Defense. Operational control is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational

control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions; it does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. Also called OPCON. See also combatant command (command authority); tactical control. (JP 1-02)

passive air defense. All measures, other than active air defense, taken to minimize the effectiveness of hostile air and missile threats against friendly forces and assets. These measures include camouflage, concealment, deception, dispersion, reconstitution, redundancy, detection and warning systems, and the use of protective construction. (JP 1-02)

planned targets. Targets that are known to exist in an operational area, and against which effects are scheduled in advance or are on-call. Examples range from targets on joint target lists in the applicable campaign plans, to targets detected in sufficient time to list in the air tasking order, mission-type orders, or fire support plans. Planned targets have two subcategories: scheduled or on-call. (JP 1-02)

positive control. A method of airspace control that relies on positive identification, tracking, and direction of aircraft within an airspace, conducted with electronic means by an agency having the authority and responsibility therein. (JP 1-02)

procedural control. A method of airspace control which relies on a combination of previously agreed and promulgated orders and procedures. (JP 1-02)

regional air defense commander. Commander subordinate to the area air defense commander and responsible for air and missile defenses in the assigned region. Exercises authorities as delegated by the area air defense commander. Also called RADC. (Approved for inclusion in the next edition of JP 1-02.)

rentry phase. None. (Approved for removal from the next edition of JP 1-02.)

rules of engagement. Directives issued by competent military authority that delineate the circumstances and limitations under which United States forces will initiate and/or continue combat engagement with other forces encountered. Also called ROE. (JP 1-02)

scheduled targets. Planned targets upon which fires will be delivered at a specific time. (JP 1-02)

sector air defense commander. Commander subordinate to an area/regional air defense commander and responsible for air and missile defenses in the assigned sector. Exercises authorities delegated

by the area/regional air defense commander. Also called SADC. (Approved for inclusion in the next edition of JP 1-02.)

supported commander. 1. The commander having primary responsibility for all aspects of a task assigned by the Joint Strategic Capabilities Plan or other joint operation planning authority. In the context of joint operation planning, this term refers to the commander who prepares operation plans or operation orders in response to requirements of the Chairman of the Joint Chiefs of Staff. 2. In the context of a support command relationship, the commander who receives assistance from another commander's force or capabilities, and who is responsible for ensuring that the supporting commander understands the assistance required. See also supporting commander. (JP 1-02)

supporting commander. 1. A commander who provides augmentation forces or other support to a supported commander or who develops a supporting plan. This includes the designated combatant commands and Department of Defense agencies as appropriate. 2. In the context of a support command relationship, the commander who aids, protects, complements, or sustains another commander's force, and who is responsible for providing the assistance required by the supported commander. See also supported commander. (JP 1-02)

suppression of enemy air defenses. Activity that neutralizes, destroys, or temporarily degrades surface-based enemy air defenses by destructive and/or disruptive means. Also called SEAD. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

tactical control. Command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed direction and control of movements or maneuvers within the operational area necessary to accomplish missions or tasks assigned. Tactical control is inherent in operational control. Tactical control may be delegated to, and exercised at any level at or below the level of combatant command. When forces are transferred between combatant commands, the command relationship the gaining commander will exercise (and the losing commander will relinquish) over these forces must be specified by the Secretary of Defense. Tactical control provides sufficient authority for controlling and directing the application of force or tactical use of combat support assets within the assigned mission or task. Also called TACON. See also combatant command (command authority); operational control. (JP 1-02)

target of opportunity. A target visible to a surface or air sensor or observer, which is within range of available weapons and against which fire has not been scheduled or requested. (JP 1-02)

target system. 1. All the targets situated in a particular geographic area and functionally related. 2. (DOD only) A group of targets that are so related that their destruction will produce some particular effect desired by the attacker. (JP 1-02)

terminal phase. That portion of the flight of a ballistic missile that begins when the warhead or payload reenters the atmosphere and ends when the warhead or payload detonates or impacts. For ballistic missiles that do not exit the atmosphere, terminal phase begins when the warhead or payload reaches apogee and ends when the warhead or payload detonates or impacts. See also boost phase; midcourse phase. (This term and its definition modify the existing term and its definition and are approved for inclusion in the next edition of JP 1-02.)

theater missile. A missile, which may be a ballistic missile, a cruise missile, or an air-to-surface missile (not including short-range, non-nuclear, direct fire missiles, bombs, or rockets such as Maverick or wire-guided missiles), whose target is within a given theater of operation. Also called TM. (JP 1-02)

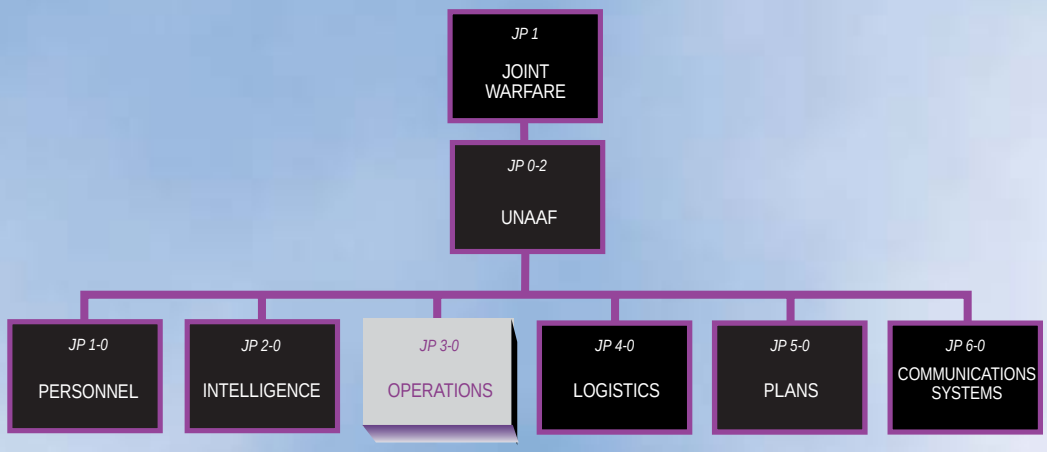
time-sensitive targets. Those targets requiring immediate response because they pose (or will soon pose) a danger to friendly forces or are highly lucrative, fleeting targets of opportunity. Also called TSTs. (JP 1-02)

unmanned aircraft. An aircraft or balloon that does not carry a human operator and is capable of flight under remote control or autonomous programming. Also called UA. (This term and its definition are provided for information and are proposed for inclusion in the next edition of JP 1-02 by JP 3-03.)

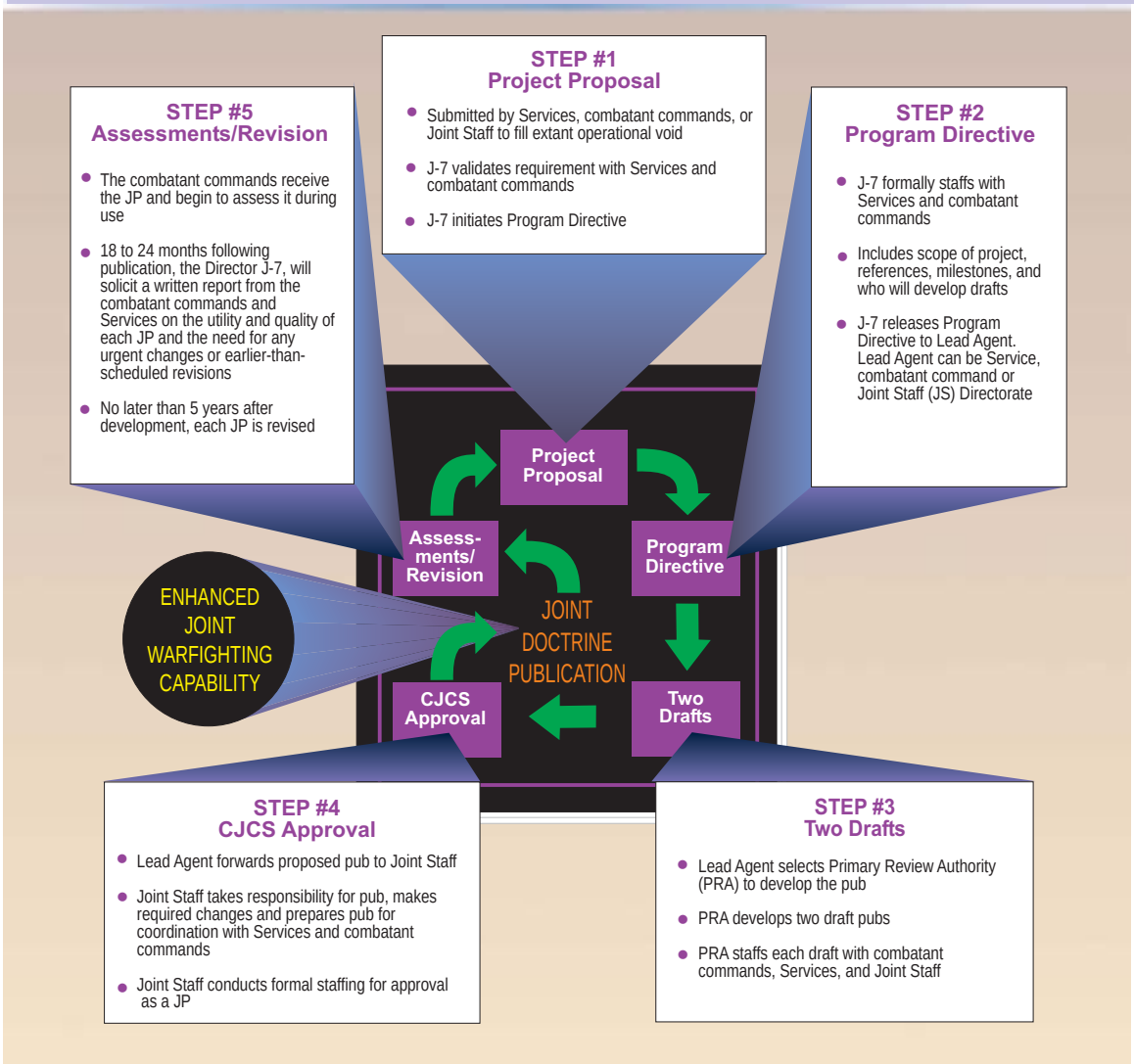
unmanned aircraft system. That system, whose components include the necessary equipment, network, and personnel to control an unmanned aircraft. Also called UAS. (This term and its definition are provided for information and are proposed for inclusion in the next edition of JP 1-02 by JP 3-03.)

weapon engagement zone. In air defense, airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with a particular weapon system. Also called WEZ. a. fighter engagement zone. In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with fighter aircraft. Also called FEZ. b. high-altitude missile engagement zone. In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with high-altitude surface-to-air missiles. Also called HIMEZ. c. low-altitude missile engagement zone. In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with low- to medium-altitude surface-to-air missiles. Also called LOMEZ. d. short-range air defense engagement zone. In air defense, that airspace of defined dimensions within which the responsibility for engagement of air threats normally rests with short-range air defense weapons. It may be established within a low- or high-altitude missile engagement zone. Also called SHORADEZ. e. joint engagement zone. In air defense, that airspace of defined dimensions within which multiple air defense systems (surface-to-air missiles and aircraft) are simultaneously employed to engage air threats. Also called JEZ. (JP 1-02)

JOINT DOCTRINE PUBLICATIONS HIERARCHY



All joint doctrine is organized into a comprehensive hierarchy as shown in the chart above. **Joint Publication (JP) 3-01** is in the **Operations** series of joint doctrine publications. The diagram below illustrates an overview of the development process:

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